ARIZONA BLM WATERSEHD WORKSHOP

JULY 10-12, 2007

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WO 220—Division of Rangeland and Watershed Resources
NATIONAL TRAINING CENTER
NATIONAL SCIENCE & TECHNOLOGY CENTER—
Division of Science Application
NATIONAL RIPARIAN SERVICE TEAM
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
ARIZONA DEPARTMENT OF WATER RESOURCES

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Agenda
Arizona BLM Watershed Workshop
July, 10, 11, & 12, 2007
BLM National Training Center
New Mexico room

Tuesday July 10, 2007:

Time	Topic	Presenter	Action
1:00	Welcome	Mike Taylor	
1:15	Introductions - Workshop Objectives Group expectations	Marlo Draper	Workshop overview
1:45	Overview of National Action Plan	Jim Renthal	What's the action plan all about?
2:45	Break		
3:00	AML	James Maes	Program status report
3:30	Overview of Riparian Strategy	John Christensen/Don Prichard	Program status report
4:00	Business Practices and Reengineering (BPR)	Mike Eberle	Status Report
4:20	Daily wrap-up	Marlo Draper	
4:45	Adjourn		

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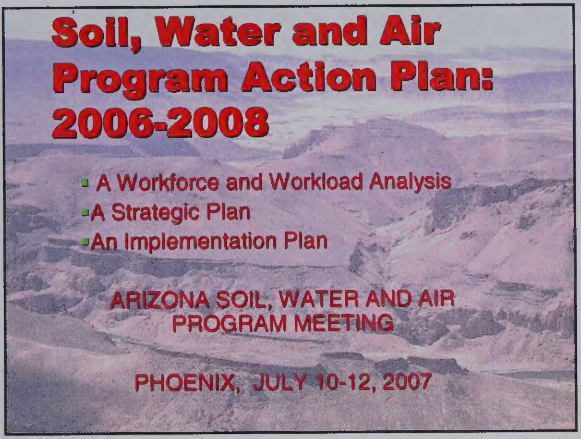
Wednesday, July 11, 2007:

Time	Topic	Presenter	Action
8:00	NSTC Functions	NSTC Cadre	NSTC Introduction, roles, and re-organization.
9:00	Soils	NSTC – Bill Ypsilantis	Software, survey status, monitoring, restoration advances/success stories.
9:45	Break		
10:00	Water Quality	ADEQ – Anel Avila	Overview of BLM water quality issues and tools for de-listing.
10:30	Water Quality	NSTC – Craig Goodwin	
11:15	Salinity	Jim Renthal	
11:45	Lunch		
1:00	AZ Water Permits and Processes	ADWR – Elizabeth Logan	Provide a "how to" work with ADWR
3:00	Break		
3:15	Riparian Resources	Ron Wiley (NRST)	Creeks & Communities; Training, restoration,
5:00	ADJOURN		

Thursday, July12 19, 2007:

Time	Topic	Presenter	Action
8:00	Air Quality	Mark Fitch	ADEQ MOU. Guidance on addressing air quality in NEPA documents
9:00	AZ Watershed Program Action Plan - Group Session	All	
Items to cover during group session:	Human Resources: *Current Staff and level of expertise *Current vacancies *Staffing needs		
	Data Needs: *Gaps *Collection/methods *Storage		
	Zone Duties and sharing agency resources		
	List of statewide issues		
	Proposed group issue resolution		
	Projects		
	Partnerships and funding sources		
11:30	Wrap-up		
12:00	Adjourn		

Overview of National Action Plan

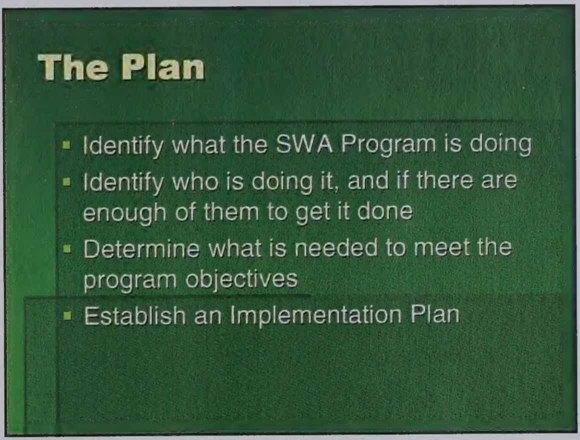


Soil, Water and Air Program Action Plan: 2006-2008

- A Workforce and Workload Analysis
- A Strategic Plan
- An Implementation Plan

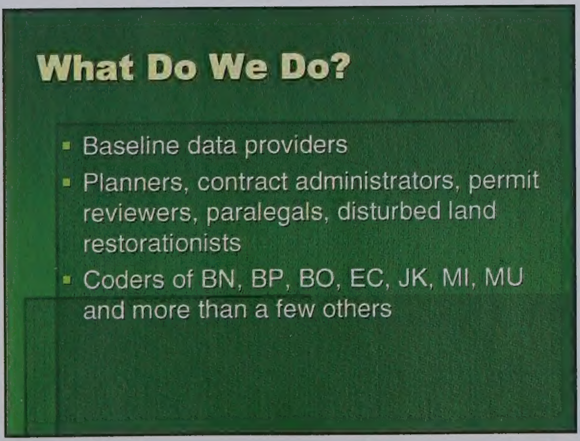
ARIZONA SOIL, WATER AND AIR
PROGRAM MEETING

PHOENIX, JULY 10-12, 2007



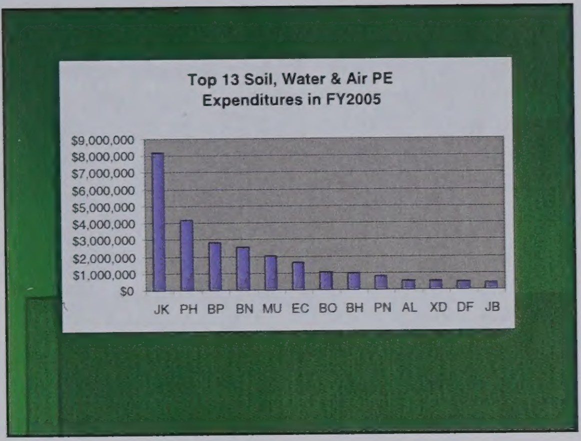
The Plan

- Identify what the SWA Program is doing
- Identify who is doing it, and if there are enough of them to get it done
- Determine what is needed to meet the program objectives
- Establish an Implementation Plan

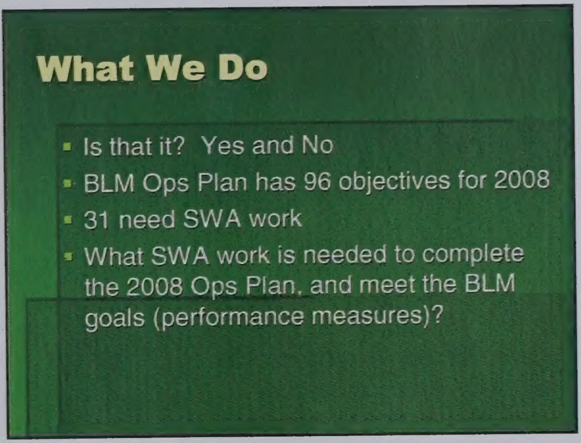


What Do We Do?

- Baseline data providers
- Planners, contract administrators, permit reviewers, paralegals, disturbed land restorationists
- Coders of BN, BP, BO, EC, JK, MI, MU and more than a few others

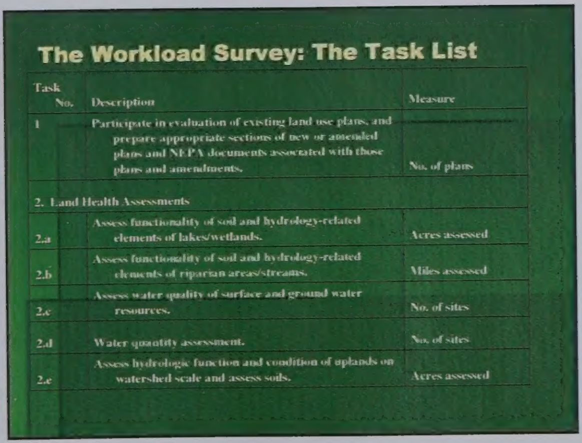


Top 13 Soil, Water & Air PE Expenditures in FY2005



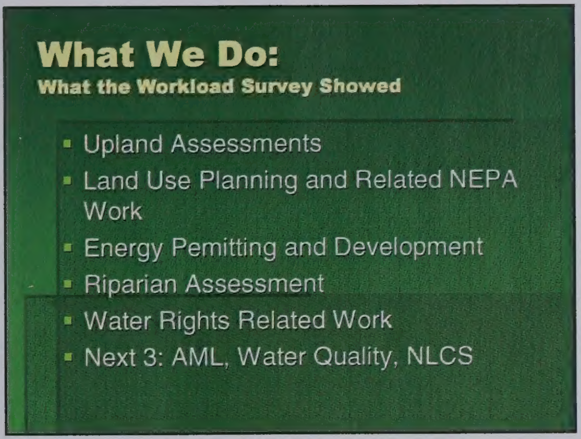
What We Do

- Is that it? Yes and No
- BLM Ops Plan has 96 objectives for 2008
- 31 need SWA work
- What SWA work is needed to complete the 2008 Ops Plan, and meet the BLM goals (performance measures)?



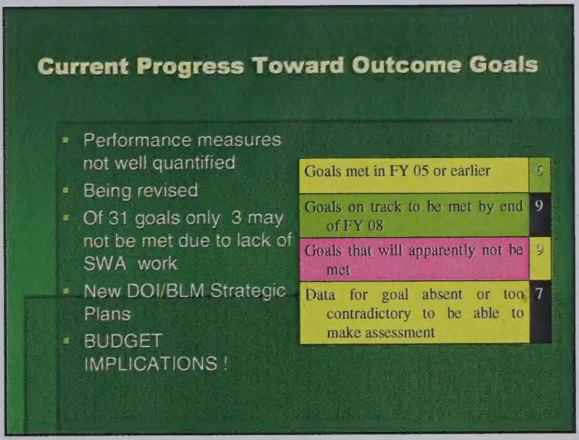
The Workload Survey: The Task List

Task No.	Description	Measure
1	Participate in evaluation of existing land use plans, and prepare appropriate sections of new or amended plans and NEPA documents associated with those plans and amendments.	No. of plans
2. Land Health Assessments		
2.a	Assess functionality of soil and hydrology-related elements of lakes/wetlands.	Acres assessed
2.b	Assess functionality of soil and hydrology-related elements of riparian areas/streams.	Miles assessed
2.c	Assess water quality of surface and ground water resources.	No. of sites
2.d	Water quantity assessment.	No. of sites
2.e	Assess hydrologic function and condition of uplands on watershed scale and assess soils.	Acres assessed



What We Do:
What the Workload Survey Showed

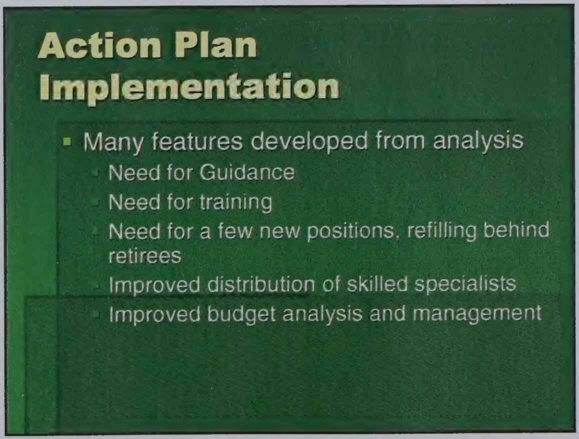
- Upland Assessments
- Land Use Planning and Related NEPA Work
- Energy Permitting and Development
- Riparian Assessment
- Water Rights Related Work
- Next 3: AML, Water Quality, NLCS



Current Progress Toward Outcome Goals

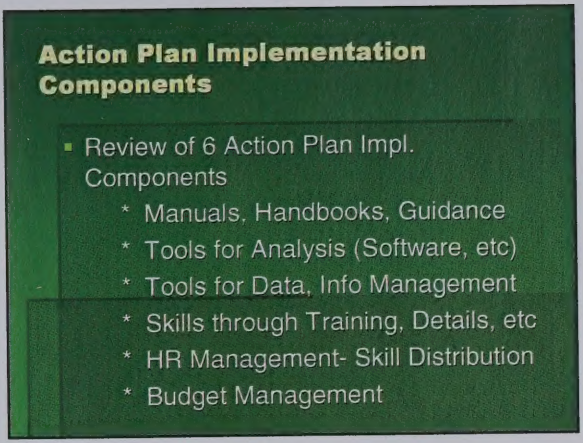
- Performance measures not well quantified
- Being revised
- Of 31 goals only 3 may not be met due to lack of SWA work
- New DOI/BLM Strategic Plans
- BUDGET IMPLICATIONS !

Goals met in FY 05 or earlier	6
Goals on track to be met by end of FY 08	9
Goals that will apparently not be met	9
Data for goal absent or too contradictory to be able to make assessment	7



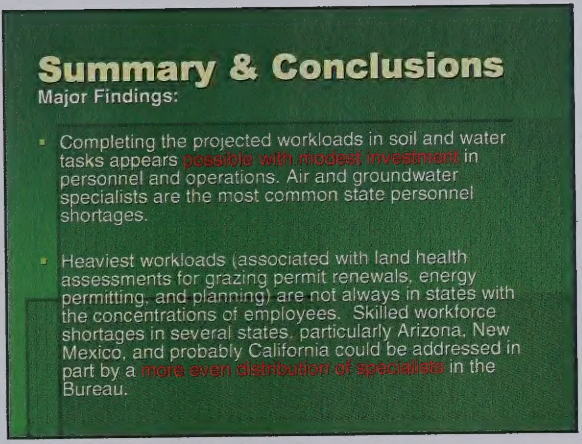
Action Plan Implementation

- Many features developed from analysis
  - Need for Guidance
  - Need for training
  - Need for a few new positions, refilling behind retirees
  - Improved distribution of skilled specialists
  - Improved budget analysis and management



Action Plan Implementation Components

- Review of 6 Action Plan Impl. Components
  - Manuals, Handbooks, Guidance
  - Tools for Analysis (Software, etc)
  - Tools for Data, Info Management
  - Skills through Training, Details, etc
  - HR Management- Skill Distribution
  - Budget Management

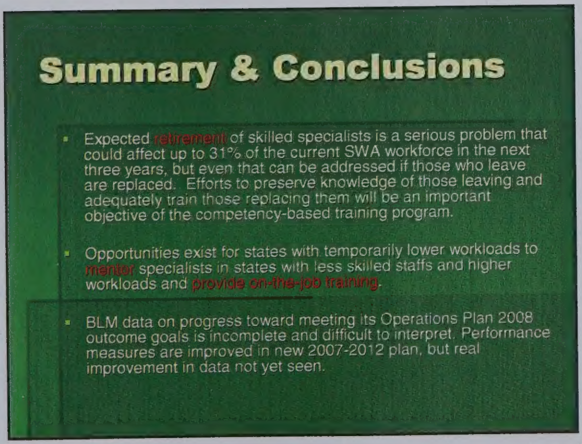


Summary & Conclusions

Major Findings:

- Completing the projected workloads in soil and water tasks appears possible with modest investment in personnel and operations. Air and groundwater specialists are the most common state personnel shortages.

- Heaviest workloads (associated with land health assessments for grazing permit renewals, energy permitting, and planning) are not always in states with the concentrations of employees. Skilled workforce shortages in several states, particularly Arizona, New Mexico, and probably California could be addressed in part by a more even distribution of specialists in the Bureau.

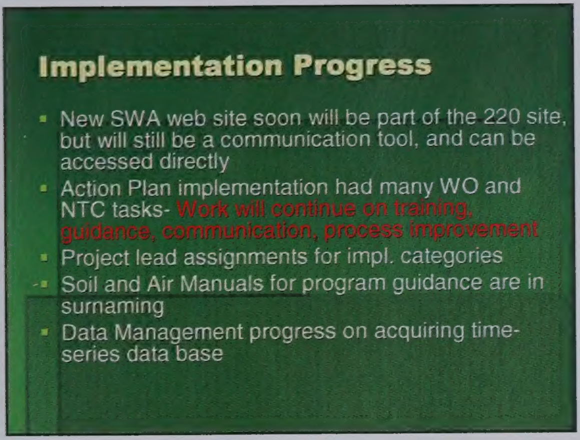


Summary & Conclusions

- Expected retirement of skilled specialists is a serious problem that could affect up to 31% of the current SWA workforce in the next three years, but even that can be addressed if those who leave are replaced. Efforts to preserve knowledge of those leaving and adequately train those replacing them will be an important objective of the competency-based training program.

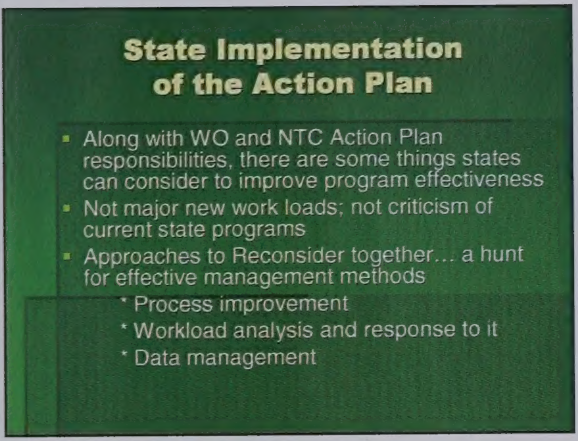
- Opportunities exist for states with temporarily lower workloads to mentor specialists in states with less skilled staffs and higher workloads and provide on-the-job training.

- BLM data on progress toward meeting its Operations Plan 2008 outcome goals is incomplete and difficult to interpret. Performance measures are improved in new 2007-2012 plan, but real improvement in data not yet seen.



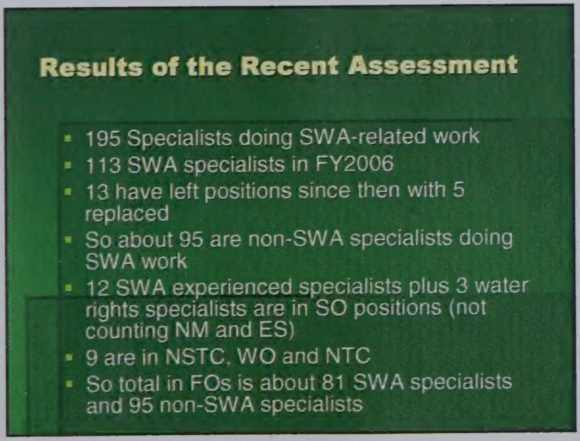
Implementation Progress

- New SWA web site soon will be part of the 220 site, but will still be a communication tool, and can be accessed directly
- Action Plan implementation had many WO and NTC tasks- Work will continue on training, guidance, communication, process improvement
- Project lead assignments for impl. categories
- Soil and Air Manuals for program guidance are in surnaming
- Data Management progress on acquiring time-series data base



State Implementation of the Action Plan

- Along with WO and NTC Action Plan responsibilities, there are some things states can consider to improve program effectiveness
- Not major new work loads; not criticism of current state programs
- Approaches to Reconsider together… a hunt for effective management methods
  - Process improvement
  - Workload analysis and response to it
  - Data management

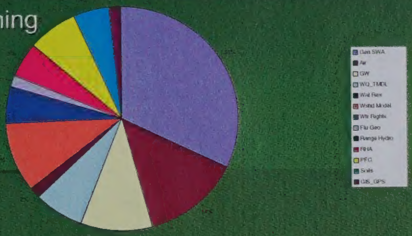


Results of the Recent Assessment

- 195 Specialists doing SWA-related work
- 113 SWA specialists in FY2006
- 13 have left positions since then with 5 replaced
- So about 95 are non-SWA specialists doing SWA work
- 12 SWA experienced specialists plus 3 water rights specialists are in SO positions (not counting NM and ES)
- 9 are in NSTC, WO and NTC
- So total in FOs is about 81 SWA specialists and 95 non-SWA specialists

Responses (Cont.)

- Training



AZ Feedback from 2006 All Program Meeting

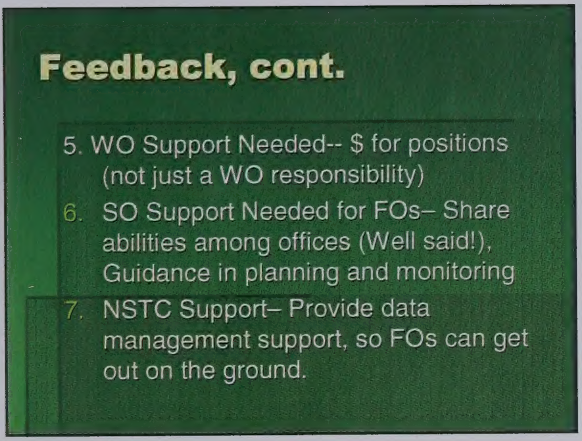
1. Key Implementation Actions:
   * Fill tech. spec. positions
   * Data Mgnt Impv.
   * Work process analysis, budget development, unit cost accounting
2. AP Workload Analysis– OK, but missing aquatic assessment, WQ monitoring

Feedback, cont.

3. Staffing– Adequate for Ops Plan and AP? NO!

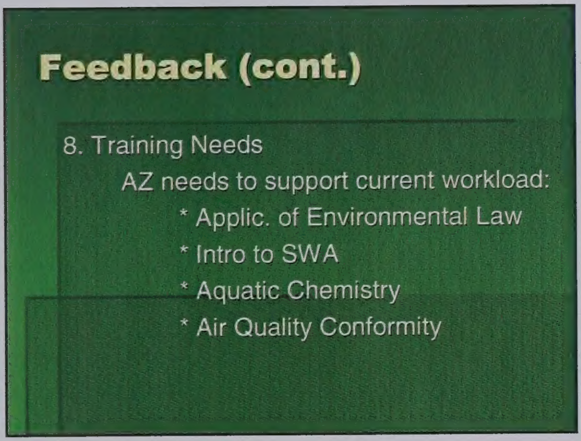
   Work foregone? YES! State partnerships, ripar. work, soil survey

   Retirement planning? NO!
4. Data Management– In use? No standard. Need to manage land health data.



Feedback, cont.

5. WO Support Needed-- $ for positions (not just a WO responsibility)
6. SO Support Needed for FOs– Share abilities among offices (Well said!), Guidance in planning and monitoring
7. NSTC Support– Provide data management support, so FOs can get out on the ground.

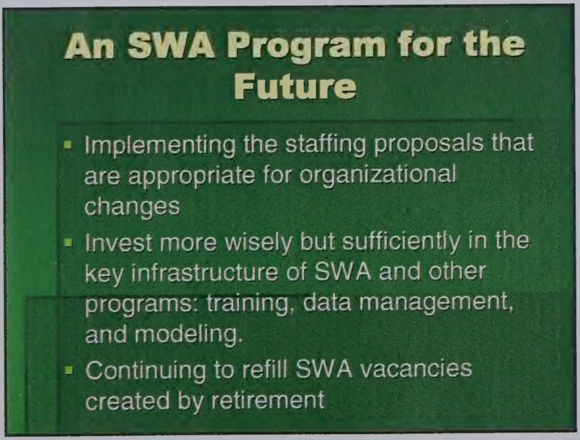


Feedback (cont.)

8. Training Needs

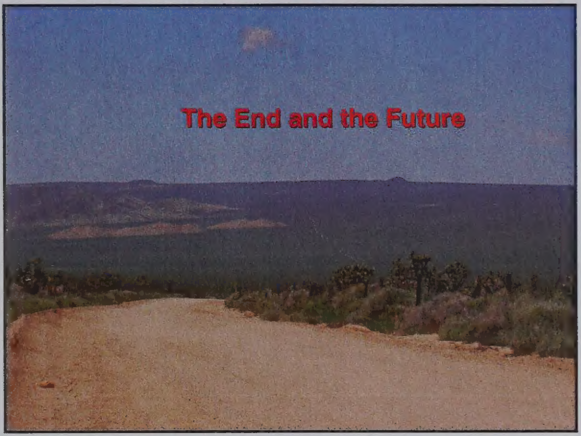
   AZ needs to support current workload:

   * Applic. of Environmental Law
   * Intro to SWA
   * Aquatic Chemistry
   * Air Quality Conformity



An SWA Program for the Future

- Implementing the staffing proposals that are appropriate for organizational changes
- Invest more wisely but sufficiently in the key infrastructure of SWA and other programs: training, data management, and modeling.
- Continuing to refill SWA vacancies created by retirement



The End and the Future

AML

Overview of
Riparian Strategy

BLM's Riparian-Wetland Program (1040)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COOPERATIVE
riparian
RESTORATION

Riparian Program

- Initiated April 22, 1985.
- Develop an Action Plan that included practical and realistic policies, guidelines, procedures, methodologies related to riparian management.
- Assigned to the Service Center (NSTC)

Field Task Force

- Inventory and Monitoring
- Management
- Treatments
- Classification
- Research and Development
- ADP
- Literature Data Base

Riparian Area Management Policy
January 22, 1987

- Definition – an area of land directly influenced by permanent water. It has visible vegetation or physical characteristic reflective of permanent water influence. Lake shore and stream banks are typical riparian areas. Excluded are such sites as ephemeral stream or washes that do not exhibit the presence of vegetation dependent upon free water in the soil

Policy Objective

To maintain, restore, or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits.

Policy Statements

- Achieve improvement and maintenance objectives through the management of existing uses wherever feasible.
- Ensure new plans and existing plans when revised recognize importance of riparian values and initiate management to maintain, restore, and improve them.
- Prescribe management based upon site-specific objectives and settings.
- Give special attention to monitoring and evaluating management activities where site-specific objectives are not being met.

Policy continued

- Cooperate with and encourage the involvement of interested Federal, State, local government and private parties to share information, implement management, etc.
- Retain ownership in public ownership unless disposal would be in the public interest…..
- Identify, encourage, and support research and studies needed to ensure that riparian area management objectives can be properly defined and met.

Tool Development

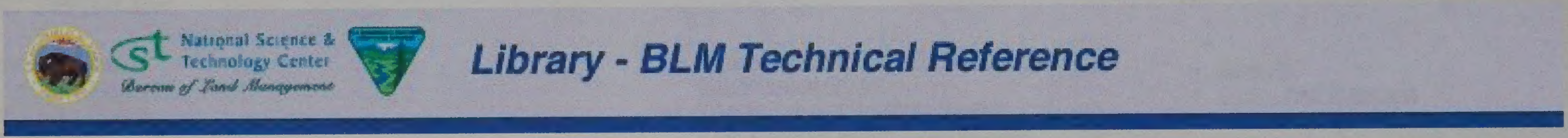
- Literature Search – TR 1737-1 – Annotated Bibliography (1987)
- Inventory Techniques – TR 1737-2 (1987), 3 (1989), & 10 (1994)
- Management Techniques – TR 1737-4 (1989) & 6 (1992)
- Classification – TR 1737-5 (1990)

Tool Development
continued

- Ecological Site Inventory (ESI) – TR 1737-7 (1992)

- Proper Functioning Condition (PFC)
  - Lotic – TR 1737-9 (1993) & 15 (1998)
  - Lentic – TR 1737-11 (1994) & 16 (1999)

Electronic Copies of TR's



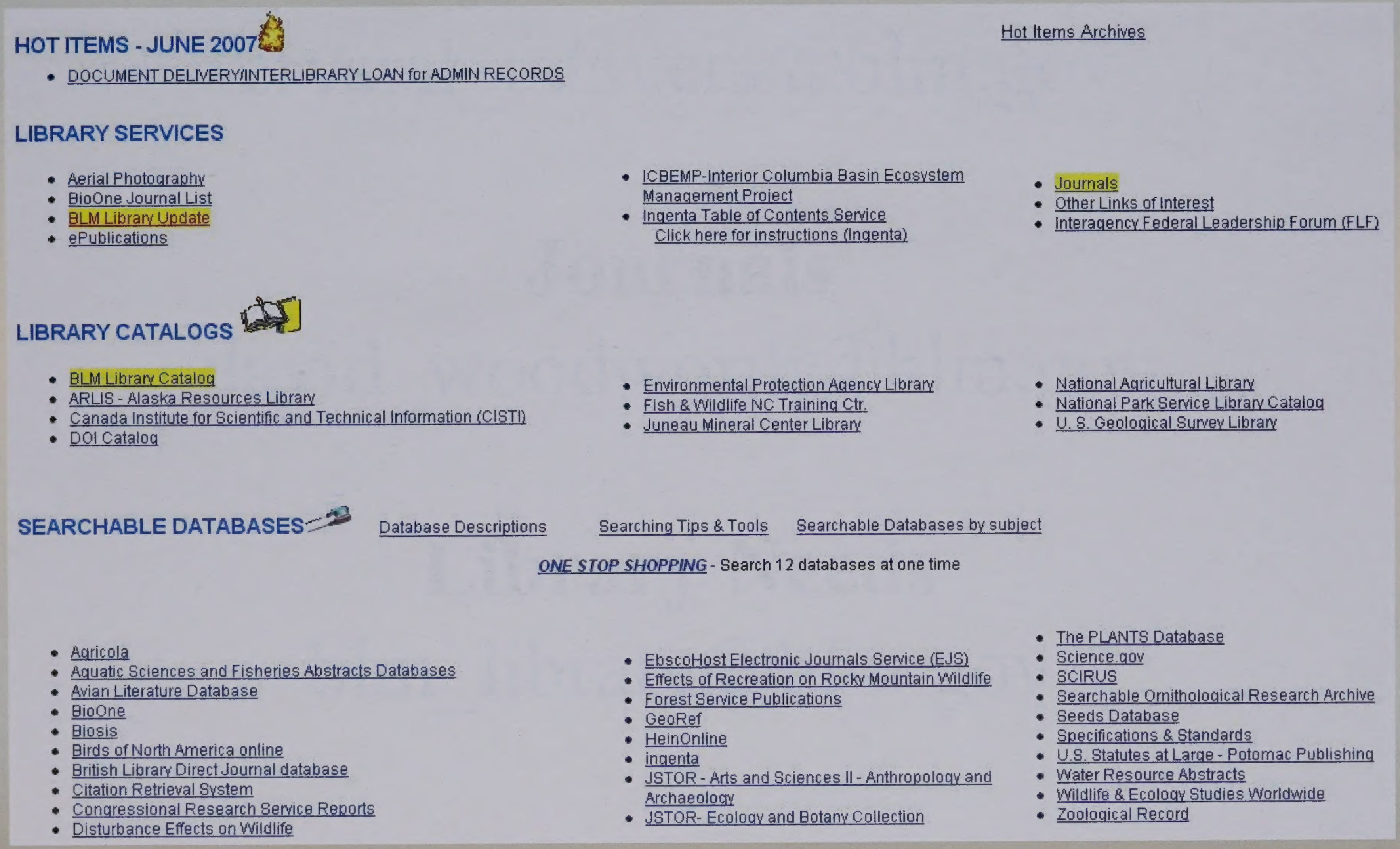
National Science & Technology Center
Bureau of Land Management

Library - BLM Technical Reference

Internal: web.nc.blm.gov/blmlibrary/

External: www.blm.gov/nstc/library/library.html

Internal Library Services



Hot Items Archives

HOT ITEMS - JUNE 2007

- DOCUMENT DELIVERY/INTERLIBRARY LOAN for ADMIN RECORDS

LIBRARY SERVICES

- Aerial Photography
- BioOne Journal List
- BLM Library Update
- ePublications
- ICBEMP-Interior Columbia Basin Ecosystem Management Project
- Ingenta Table of Contents Service
  Click here for instructions (Ingenta)
- Journals
- Other Links of Interest
- Interagency Federal Leadership Forum (FLF)

LIBRARY CATALOGS

- BLM Library Catalog
- ARLIS - Alaska Resources Library
- Canada Institute for Scientific and Technical Information (CISTI)
- DOI Catalog
- Environmental Protection Agency Library
- Fish & Wildlife NC Training Ctr.
- Juneau Mineral Center Library
- National Agricultural Library
- National Park Service Library Catalog
- U. S. Geological Survey Library

SEARCHABLE DATABASES

Database Descriptions

Searching Tips & Tools

Searchable Databases by subject

ONE STOP SHOPPING - Search 12 databases at one time

- Agricola
- Aquatic Sciences and Fisheries Abstracts Databases
- Avian Literature Database
- BioOne
- Biosis
- Birds of North America online
- British Library Direct Journal database
- Citation Retrieval System
- Congressional Research Service Reports
- Disturbance Effects on Wildlife
- EbscoHost Electronic Journals Service (EJS)
- Effects of Recreation on Rocky Mountain Wildlife
- Forest Service Publications
- GeoRef
- HeinOnline
- ingenta
- JSTOR - Arts and Sciences II - Anthropology and Archaeology
- JSTOR- Ecology and Botany Collection
- The PLANTS Database
- Science.gov
- SCIRUS
- Searchable Ornithological Research Archive
- Seeds Database
- Specifications & Standards
- U.S. Statutes at Large - Potomac Publishing
- Water Resource Abstracts
- Wildlife & Ecology Studies Worldwide
- Zoological Record

Library Monthly Updates

crystal_talavera@blm.gov

Journals

david_woodworth@blm.gov

Library Needs

blm_library@blm.gov

Assessment/Inventory Tools

- Require interdisciplinary (ID) teams
  - Hydrology
  - Vegetation
  - Soils
  - Biology

Riparian-Wetland Initiative for the 1990's - Goals

- Restoration and Maintenance
- Protection
- Information and Education
- Coordination and Cooperation

Progress Today
Riparian-Wetland Program
Alaska & Lower 48 States

STREAMS/RIPARIAN MILES

- 143,188 miles
- 75% Stream/Riparian miles ALASKA
- 35,623 miles of Stream/Riparian areas in Lower 48

LAKES/WETLANDS ACRES

- 12,828,487 acres
- 98% Lakes/Wetland acres ALASKA
- 276,189 acres of Lakes/Wetlands are in the Lower 48 states

PFC or Functional-at Risk with Upward Trend

STREAMS/RIPARIAN MILES

- BLM
  127,975 miles or 89%
- Lower 48 States
  20,460 Miles or 57%

1996 Perspective

- 30% were PFC or Functional-at-risk with upward trend
- 27% Improvement

LAKES/WETLANDS ACRES

- BLM
  12,618,360 acres or 98%
- Lower 48 States
  214,572 or 78%

1996 Perspective

- 20% were PFC or Functional-at-risk with upward trend
- 58% Improvement

Arizona

Stream/Riparian Miles

- 879 miles

PFC or Functional-at-risk upward trend

- 456 miles or 51%

Lakes/Wetland Acres

- 22,260 acres

PFC or Functional-at-risk upward trend

- 18,106 acres or 81%

Static Trend

For the past 10 years however there has been a 21 mile increase in Stream/Riparian health and 178 acre increase in Lake/Wetlands health.

1040 Budget

- **BLM – MLR Budget** - $ 891,000,000 - average annually
- **BLM Riparian Budget** - $ 21,000,000 – (2% of the BLM's MLR Budget)
- **Arizona's Riparian Budget** - $ 1,700,000 – (8% of the BLM Riparian budget)

“RIPARIAN PRIORITY PEs”
(BU, BV, JF, JG, JH, JI, MN, MO)

- **BLM –MLR Spent on** - $ 22.4 million dollars spent annually **3%** of the MLR Budget annually

- **BLM 1040 Budget-** $ 6.7 million dollars spent annually **32%** of the budget/annually

- **Arizona’s 1040 Budget** - $ 594 thousand dollars spent annually **33%** of Arizona’s Riparian budget/annually.

Accelerating Cooperative riparian Restoration and Management

In 1996 the BLM and the FS joined forces knowing for us to be successful in managing this important resource we needed to do it in concert. And NRCS was welcomed as a principle partner.

December 2002 Strategy

- Creeks and Communities: A continuing Strategy for Accelerating Cooperative Riparian Restoration and Management

- A strategy designed to integrate the physical, biological, and social dimensions of riparian-wetland management to achieve results for resources and communities.

One of the Principle Tools used in this strategy

TR 1737-15

RIPARIAN AREA MANAGEMENT

TR 1737-15 1998

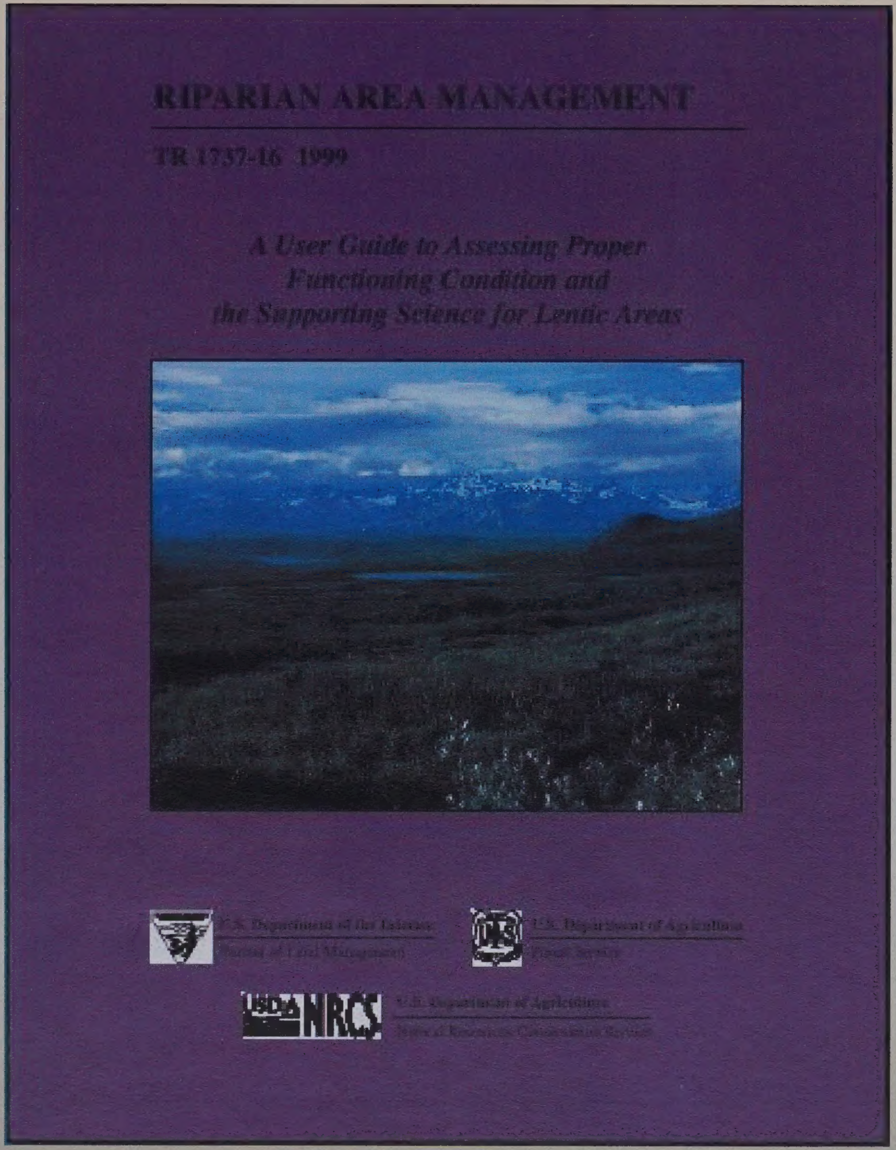
A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas

U.S. Department of the Interior
Bureau of Land Management

U.S. Department of Agriculture
Forest Service

USDA NRCS U.S. Department of Agriculture
Natural Resources Conservation Service

TR 1737-16



RIPARIAN AREA MANAGEMENT

TR 1737-16 1999

A User Guide to Assessing Proper
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Bureau of Land Management

U.S. Department of Agriculture
Forest Service

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Natural Resources Conservation Service

a World of Information Within Reach

BLM LIBRARY

BLM

Library Services Available at Your Desktop

http://web.nc.blm.gov/blmlibrary

Full-text journals, including:

(JSTOR and BioOne)

Ingenta (tables of contents for professional journals)

BLM Library Update (citations of recent publications)

Web links of interest to BLM

HeinOnline (image-based law resources)

Federated search engine

(one-stop searching in 12 databases)

User searchable databases, including:

- AGRICOLA
- Aquatic Sciences and Fisheries Abstracts
- BIOSIS Previews
- Birds of North America
- GeoRef
- Water Resources Abstracts
- Wildlife and Ecology Studies Worldwide
- Zoological Record Online

AND MORE

BLM publications links

BLM Library catalog

Library Services Available by E-mail or Phone

blm_library@blm.gov *303-236-6650*

Interlibrary loan and document delivery

Customized subject bibliographies

Legal references

Cadastral notes and plats 303-236-0591

Aerial photography archives 303-236-7991

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Overview of AZ
Program Trends

NSTC Functions

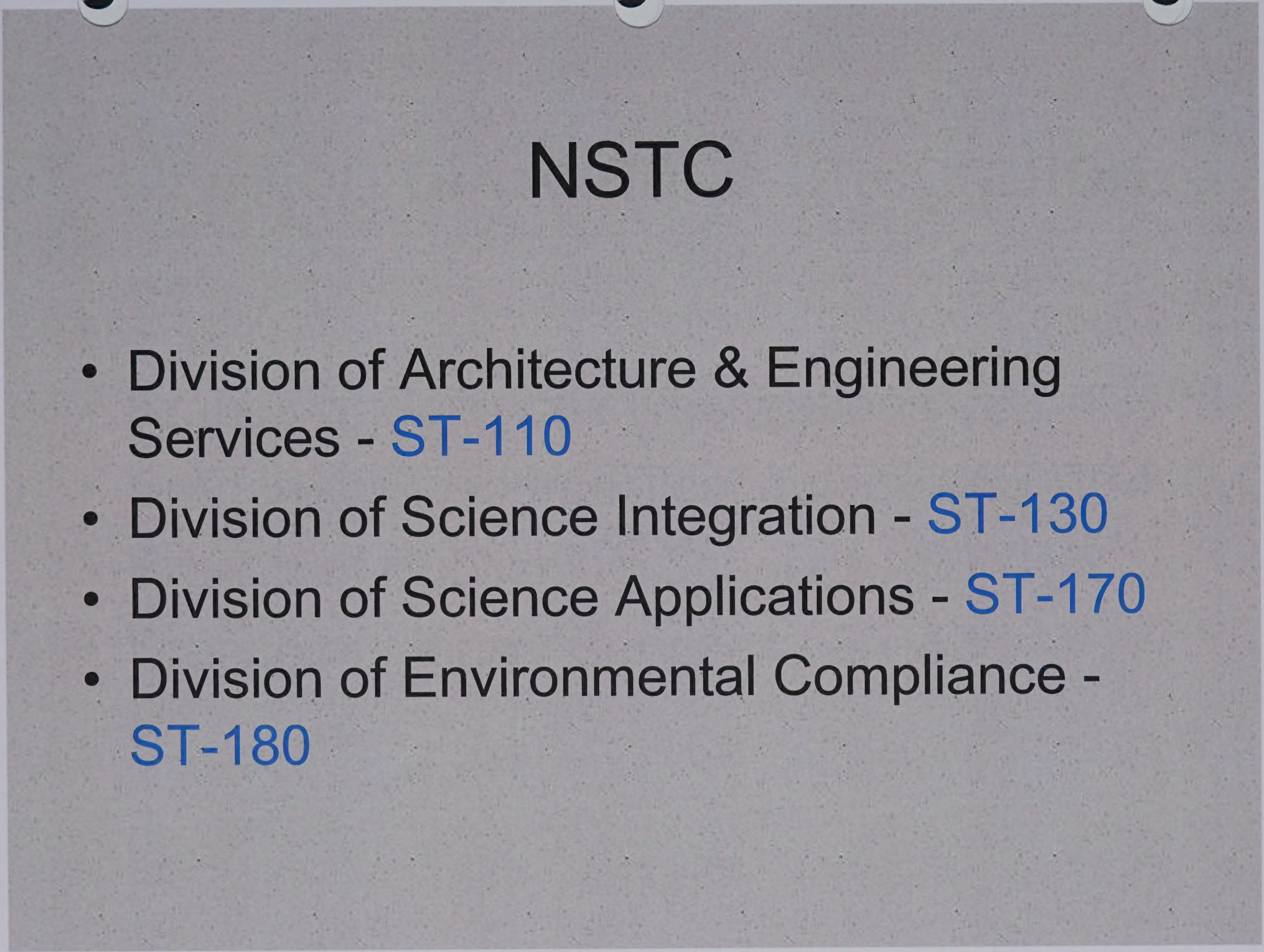
Proposed
National Operation Center

Combines the Five National Centers

- National Business Center
- National Human Resources Management Center
- National IRM Center
- National Science & Technology Center
- National Training Center

Resource Management Support to Arizona's 1010, AML, & 1040 Programs

- National Science & Technology Center
- National Training Center



NSTC

- Division of Architecture & Engineering Services - ST-110
- Division of Science Integration - ST-130
- Division of Science Applications - ST-170
- Division of Environmental Compliance - ST-180

Division of Science Integration

- Branch of Science Investigations - ST-131
- Branch of Resource Technology - ST-134
- Branch of Publishing Services - ST-135
- Branch of Library Services - ST-136

Key Functions

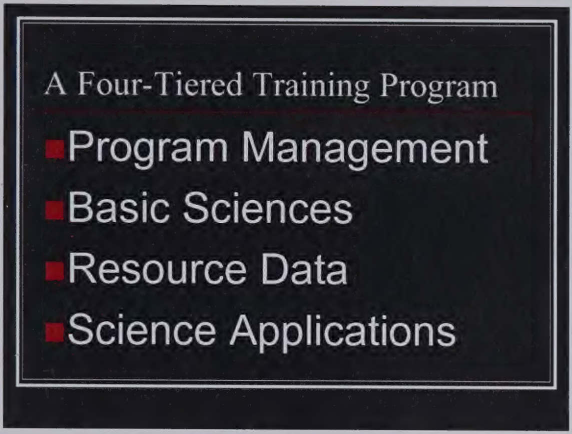
- Scare Skills – Soils, Hydrology, Water Quality, Air Quality, Fisheries, Riparian, etc.
- Publication, Posters, Editing, etc.
- Library Searches/Data Bases/Journals
- Remote Sensing/Photogrammatry/GIS
- Additional Needs – National Contracts (NAC), Interagency agreements (USGS)

See handouts for more detail

Questions?

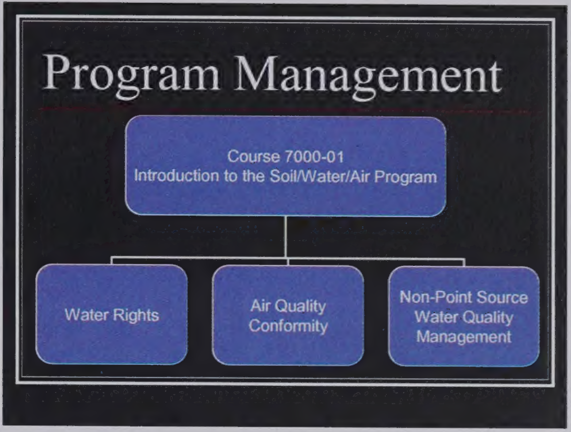
National Training Center

Jim Fogg



A Four-Tiered Training Program

- Program Management
- Basic Sciences
- Resource Data
- Science Applications



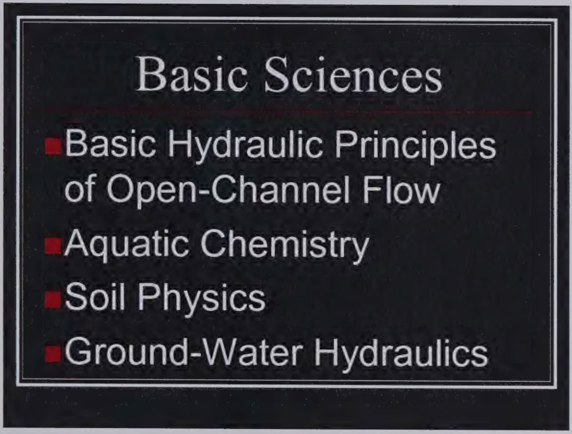
Program Management

Course 7000-01
Introduction to the Soil/Water/Air Program

Water Rights

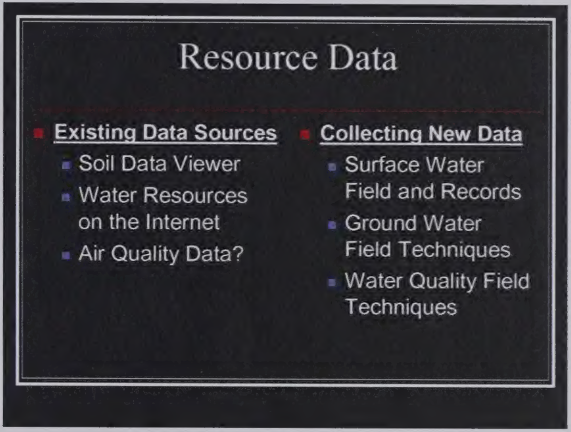
Air Quality Conformity

Non-Point Source Water Quality Management



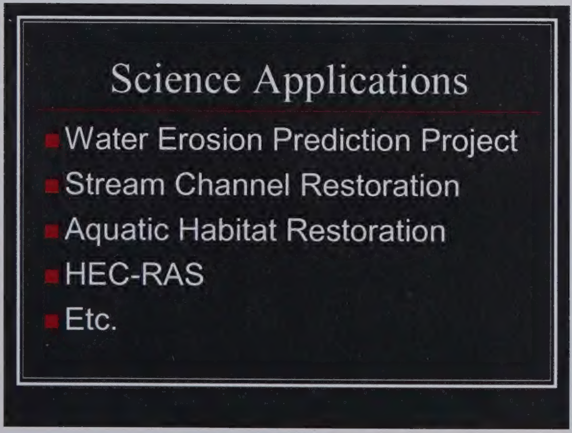
Basic Sciences

- Basic Hydraulic Principles of Open-Channel Flow
- Aquatic Chemistry
- Soil Physics
- Ground-Water Hydraulics



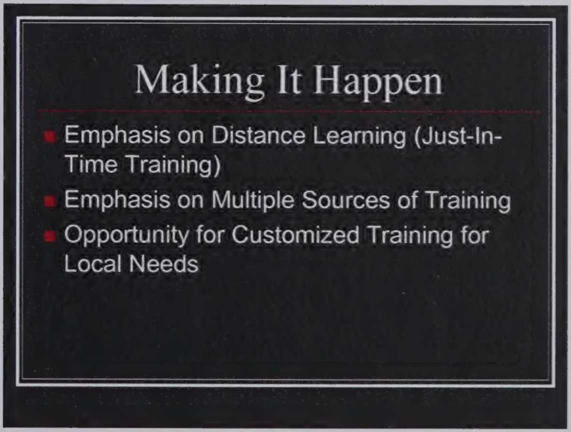
Resource Data

- **Existing Data Sources**
  - Soil Data Viewer
  - Water Resources on the Internet
  - Air Quality Data?
- **Collecting New Data**
  - Surface Water Field and Records
  - Ground Water Field Techniques
  - Water Quality Field Techniques



Science Applications

- Water Erosion Prediction Project
- Stream Channel Restoration
- Aquatic Habitat Restoration
- HEC-RAS
- Etc.



Making It Happen

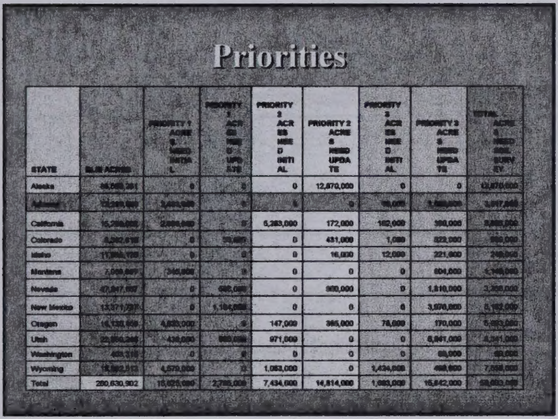
- Emphasis on Distance Learning (Just-In-Time Training)
- Emphasis on Multiple Sources of Training
- Opportunity for Customized Training for Local Needs

Soils

Status of BLM Soil Program: Implications for Arizona

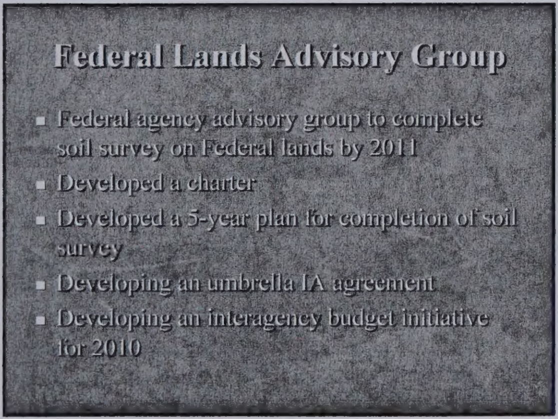
Bill Ypsilantis

National Science and Technology Center



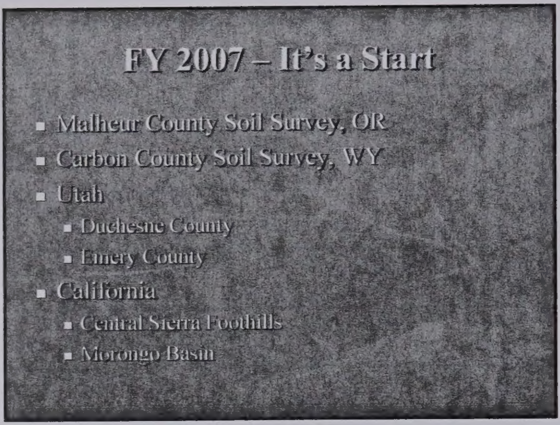
Priorities

STATE	BLM ACRES	PRIORITY 1 ACRES NEED INITIAL	PRIORITY 1 ACRES NEED UPDATE	PRIORITY 2 ACRES NEED INITIAL	PRIORITY 2 ACRES NEED UPDATE	PRIORITY 3 ACRES NEED INITIAL	PRIORITY 3 ACRES NEED UPDATE	TOTAL ACRES NEED SOIL SURVEY
Alaska	[illegible]	0	0	0	12,870,000	0	0	12,870,000
Arizona	[illegible]	[illegible]	0	0	0	[illegible]	[illegible]	[illegible]
California	[illegible]	[illegible]	0	5,283,000	172,000	182,000	390,000	[illegible]
Colorado	[illegible]	0	[illegible]	0	431,000	1,000	322,000	[illegible]
Idaho	[illegible]	0	0	0	16,000	12,000	221,000	249,000
Montana	7,9[illegible]	340,000	0	0	0	0	804,000	[illegible]
Nevada	47,8[illegible]	0	[illegible]	0	900,000	0	1,810,000	3,3[illegible]
New Mexico	13,371,7[illegible]	0	1,104,000	0	0	0	3,976,000	5,182,000
Oregon	16,1[illegible]	4,833,000	0	147,000	365,000	78,000	170,000	5,593,000
Utah	22,8[illegible]	430,000	[illegible]	971,000	0	0	6,941,000	8,341,000
Washington	[illegible]	0	0	0	0	0	69,000	69,000
Wyoming	18,3[illegible]	4,579,000	0	1,063,000	0	1,434,000	498,000	7,5[illegible]
Total	260,630,902	15,625,000	2,785,000	7,434,000	14,814,000	1,693,000	15,842,000	[illegible]



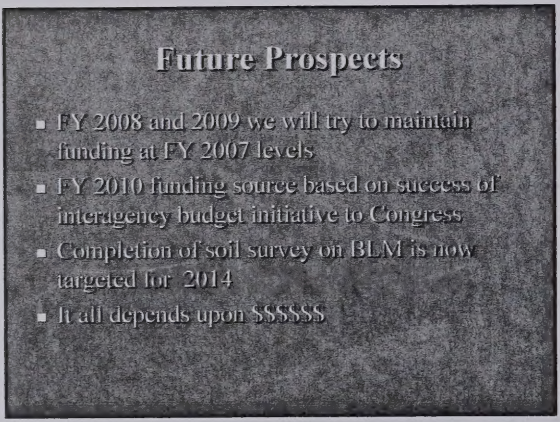
Federal Lands Advisory Group

- Federal agency advisory group to complete soil survey on Federal lands by 2011
- Developed a charter
- Developed a 5-year plan for completion of soil survey
- Developing an umbrella IA agreement
- Developing an interagency budget initiative for 2010



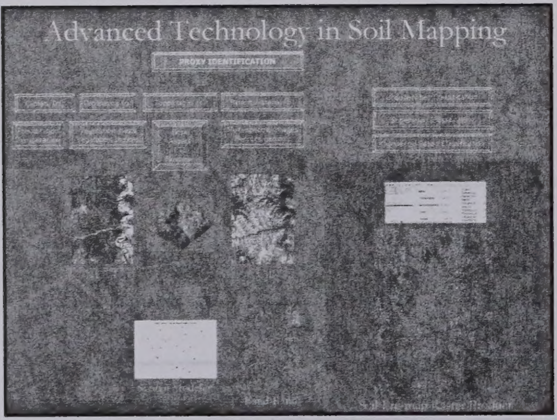
FY 2007 – It's a Start

- Malheur County Soil Survey, OR
- Carbon County Soil Survey, WY
- Utah
  - Duchesne County
  - Emery County
- California
  - Central Sierra Foothills
  - Morongo Basin

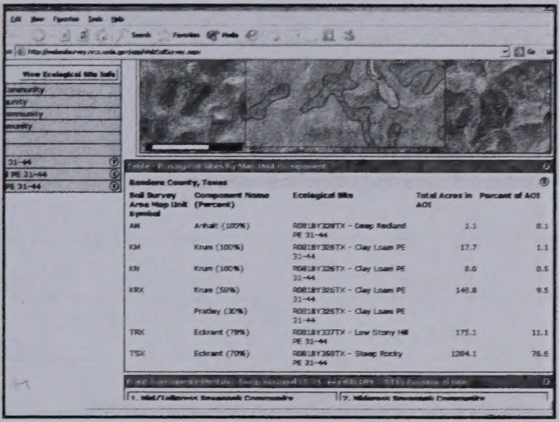


Future Prospects

- FY 2008 and 2009 we will try to maintain funding at FY 2007 levels
- FY 2010 funding source based on success of interagency budget initiative to Congress
- Completion of soil survey on BLM is now targeted for 2014
- It all depends upon $$$$$$

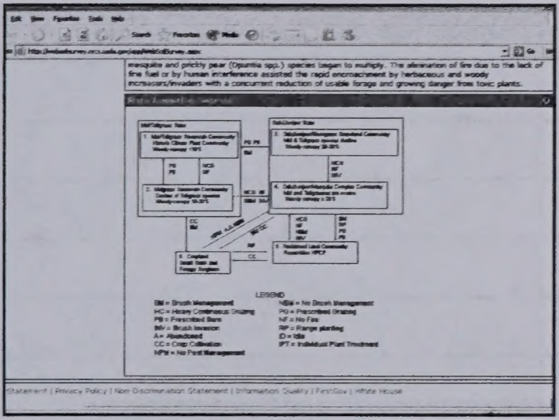


Advanced Technology in Soil Mapping



Bandera County, Texas

Soil Survey Area Map Unit Symbol	Component Name (Percent)	Ecological Site	Total Acres in AOI	Percent of AOI
AN	Anhalt (100%)	R081BY328TX - Deep Redland PE 31-44	1.1	0.1
KM	Krum (100%)	R081BY326TX - Clay Loam PE 31-44	17.7	1.1
KN	Krum (100%)	R081BY326TX - Clay Loam PE 31-44	8.0	0.5
KRX	Krum (50%)	R081BY326TX - Clay Loam PE 31-44	148.8	9.5
	Pratley (30%)	R081BY326TX - Clay Loam PE 31-44		
TRX	Eckrant (78%)	R081BY337TX - Low Stony Hill PE 31-44	175.1	11.1
TSX	Eckrant (70%)	R081BY360TX - Steep Rocky PE 31-44	1204.1	76.6



mesquite and prickly pear (Opuntia spp.) species began to multiply. The elimination of fire due to the lack of fine fuel or by human interference assisted the rapid encroachment by herbaceous and woody increasers/invaders with a concurrent reduction of usable forage and growing danger from toxic plants.

LEGEND

BM = Brush Management
HC = Heavy Continuous Grazing
PB = Prescribed Burn
BrV = Brush Invasion
A= Abandoned
CC = Crop Cultivation
NPM = No Pest Management
NBM = No Brush Management
PG = Prescribed Grazing
NF = No Fire
RP = Range planting
ID = Idle
IPT = Individual Plant Treatment

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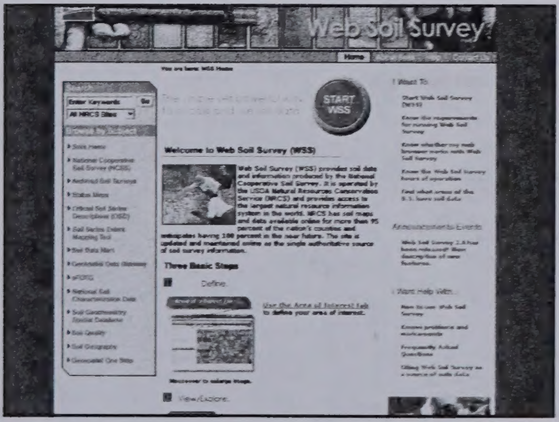


You are here: WSS Home

Welcome to Web Soil Survey (WSS)

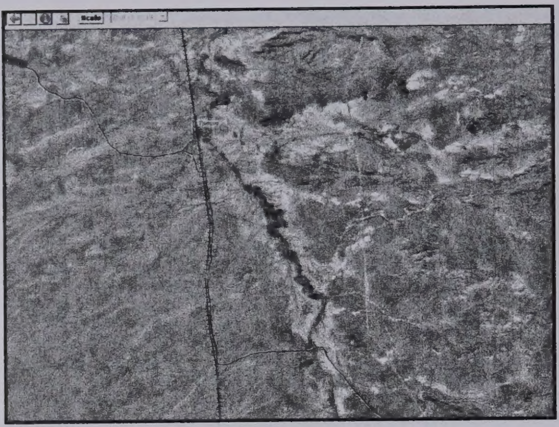
Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

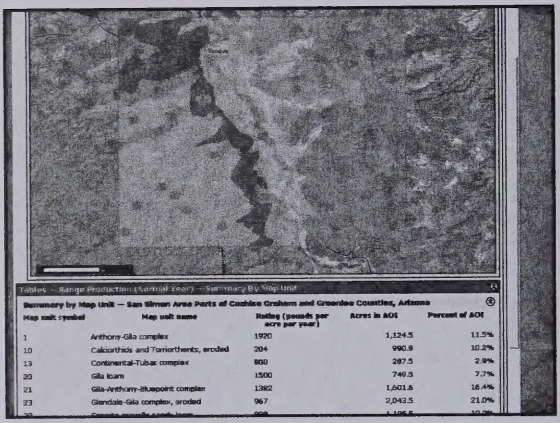
Three Basic Steps

Define.

Use the Area of Interest tab to define your area of interest.

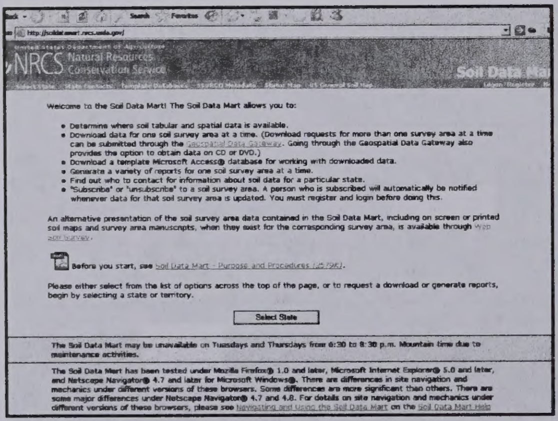
View/Explore.




Tables — Range Production (Normal Year) — Summary By Map Unit

Summary by Map Unit — San Simon Area Parts of Cochise Graham and Greenlee Counties, Arizona

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
1	Anthony-Gila complex	1920	1,124.5	11.5%
10	Calciorthids and Torriorthents, eroded	204	990.9	10.2%
13	Continental-Tubac complex	800	287.5	2.9%
20	Gila loam	1500	749.5	7.7%
21	Gila-Anthony-Bluepoint complex	1382	1,601.6	16.4%
23	Glendale-Gila complex, eroded	967	2,043.5	21.0%


Search
Favorites
http://soildatamart.nrcs.usda.gov/
United States Department of Agriculture
NRCS Natural Resources Conservation Service
Soil Data Mar
Select State
Login / Register

Welcome to the Soil Data Mart! The Soil Data Mart allows you to:

- Determine where soil tabular and spatial data is available.
- Download data for one soil survey area at a time. (Download requests for more than one survey area at a time can be submitted through the Geospatial Data Gateway. Going through the Geospatial Data Gateway also provides the option to obtain data on CD or DVD.)
- Download a template Microsoft Access® database for working with downloaded data.
- Generate a variety of reports for one soil survey area at a time.
- Find out who to contact for information about soil data for a particular state.
- "Subscribe" or "unsubscribe" to a soil survey area. A person who is subscribed will automatically be notified whenever data for that soil survey area is updated. You must register and login before doing this.

An alternative presentation of the soil survey area data contained in the Soil Data Mart, including on screen or printed soil maps and survey area manuscripts, when they exist for the corresponding survey area, is available through Web Soil Survey.

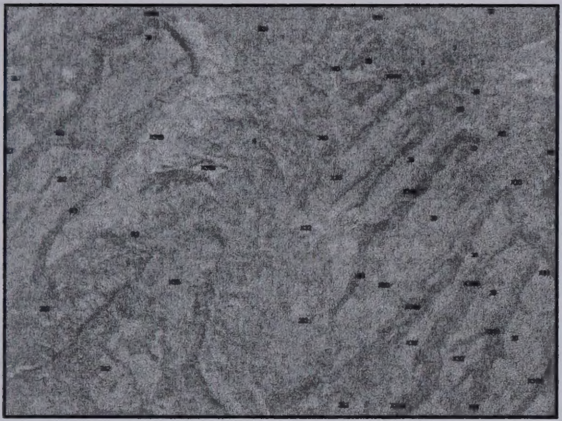
Before you start, see Soil Data Mart - Purpose and Procedures (257KB).

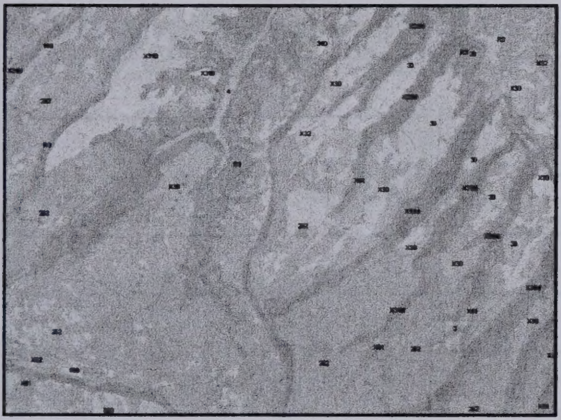
Please either select from the list of options across the top of the page, or to request a download or generate reports, begin by selecting a state or territory.

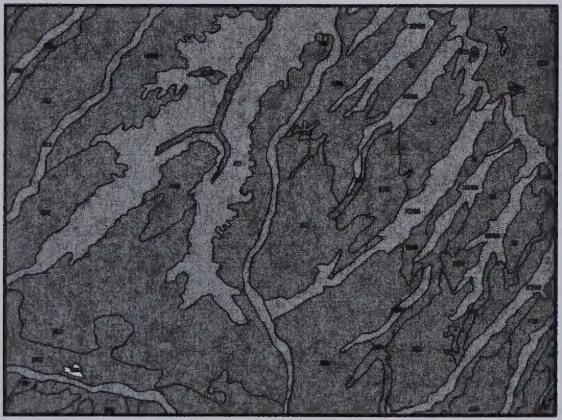
Select State

The Soil Data Mart may be unavailable on Tuesdays and Thursdays from 6:30 to 8:30 p.m. Mountain time due to maintenance activities.

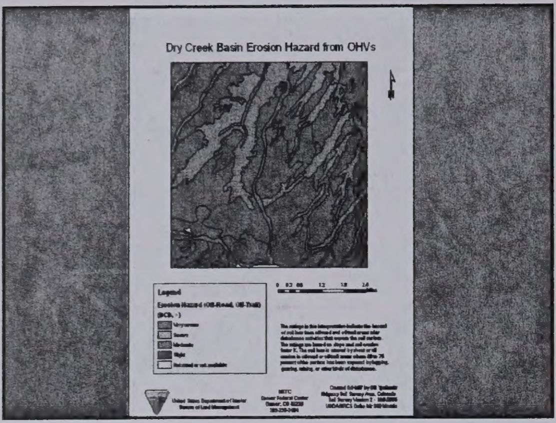
The Soil Data Mart has been tested under Mozilla Firefox® 1.0 and later, Microsoft Internet Explorer® 5.0 and later, and Netscape Navigator® 4.7 and later for Microsoft Windows®. There are differences in site navigation and mechanics under different versions of these browsers. Some differences are more significant than others. There are some major differences under Netscape Navigator® 4.7 and 4.8. For details on site navigation and mechanics under different versions of these browsers, please see Navigating and Using the Soil Data Mart on the Soil Data Mart Help

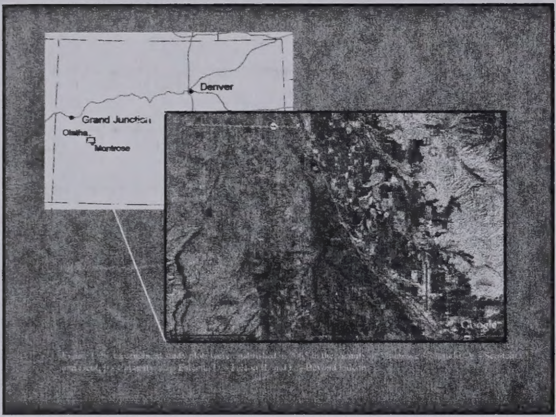


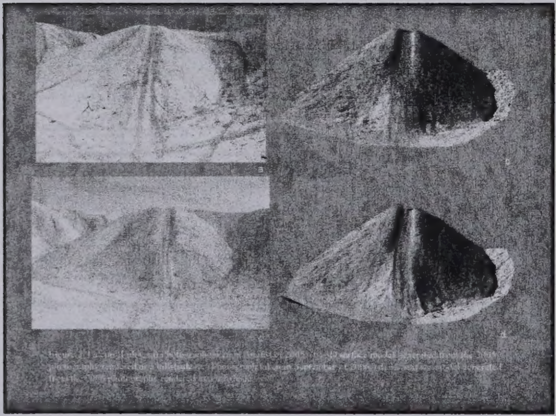


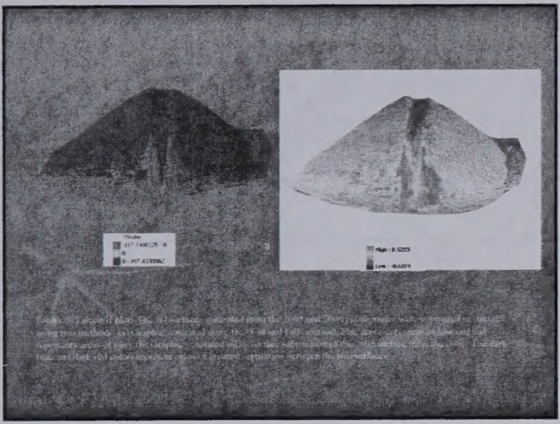


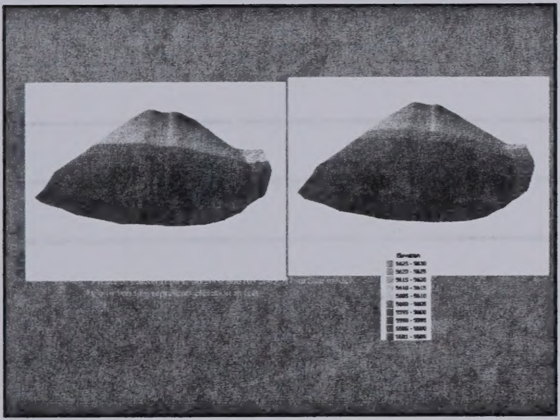
Dry Creek Basin Erosion Hazard from OHVs

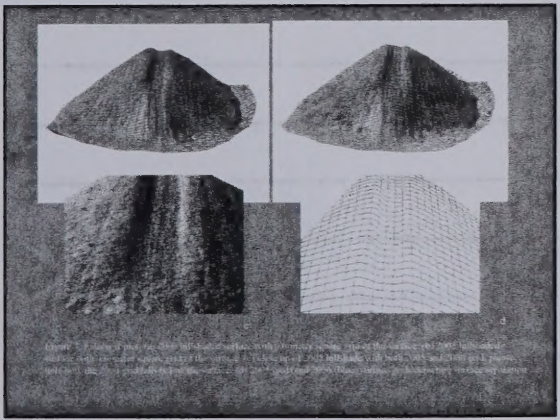

Legend
Erosion Hazard (Off-Road, Off-Trail)
Very severe
Severe
Moderate
Slight
Not rated or not available
United States Department of the Interior
Bureau of Land Management

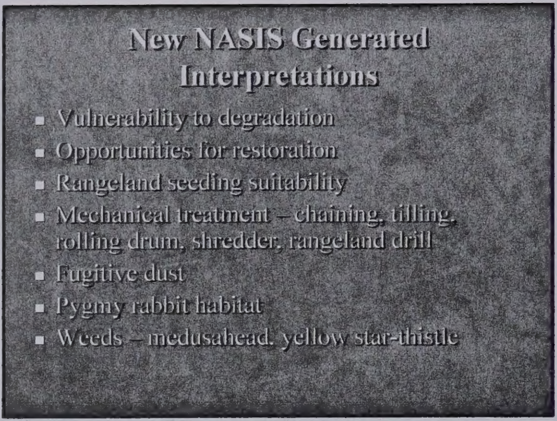





High : 0.5223

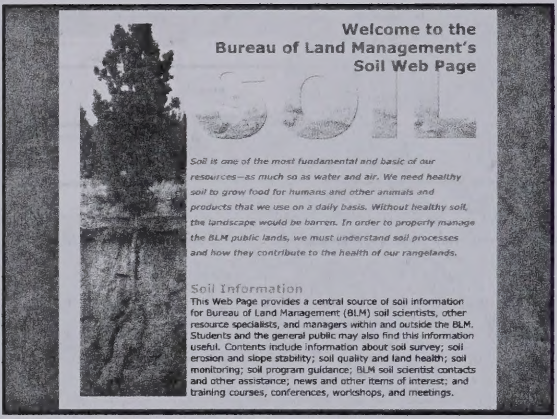

Elevation


c
d



New NASIS Generated Interpretations

- Vulnerability to degradation
- Opportunities for restoration
- Rangeland seeding suitability
- Mechanical treatment – chaining, tilling, rolling drum, shredder, rangeland drill
- Fugitive dust
- Pygmy rabbit habitat
- Weeds – medusahead, yellow star-thistle

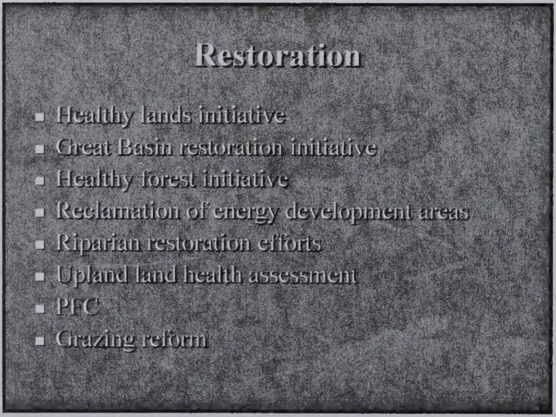


Welcome to the
Bureau of Land Management's
Soil Web Page

Soil is one of the most fundamental and basic of our resources—as much so as water and air. We need healthy soil to grow food for humans and other animals and products that we use on a daily basis. Without healthy soil, the landscape would be barren. In order to properly manage the BLM public lands, we must understand soil processes and how they contribute to the health of our rangelands.

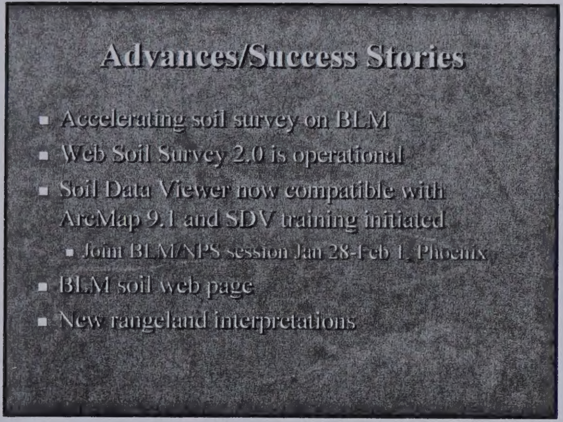
Soil Information

This Web Page provides a central source of soil information for Bureau of Land Management (BLM) soil scientists, other resource specialists, and managers within and outside the BLM. Students and the general public may also find this information useful. Contents include information about soil survey; soil erosion and slope stability; soil quality and land health; soil monitoring; soil program guidance; BLM soil scientist contacts and other assistance; news and other items of interest; and training courses, conferences, workshops, and meetings.



Restoration

- Healthy lands initiative
- Great Basin restoration initiative
- Healthy forest initiative
- Reclamation of energy development areas
- Riparian restoration efforts
- Upland land health assessment
- PFC
- Grazing reform

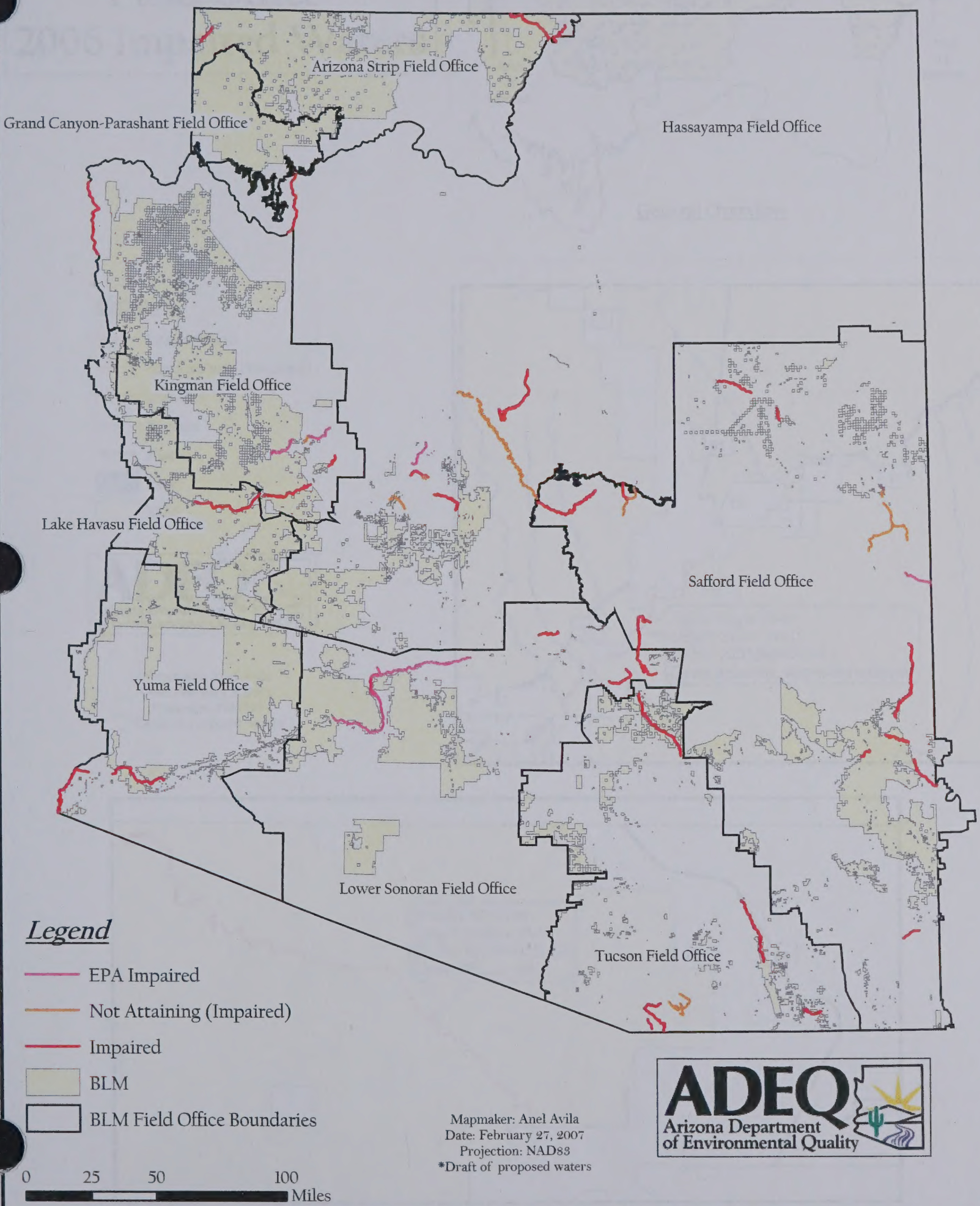


Advances/Success Stories

- Accelerating soil survey on BLM
- Web Soil Survey 2.0 is operational
- Soil Data Viewer now compatible with ArcMap 9.1 and SDV training initiated
    - Joint BLM/NPS session Jan 28-Feb 1, Phoenix
- BLM soil web page
- New rangeland interpretations

Water Quality

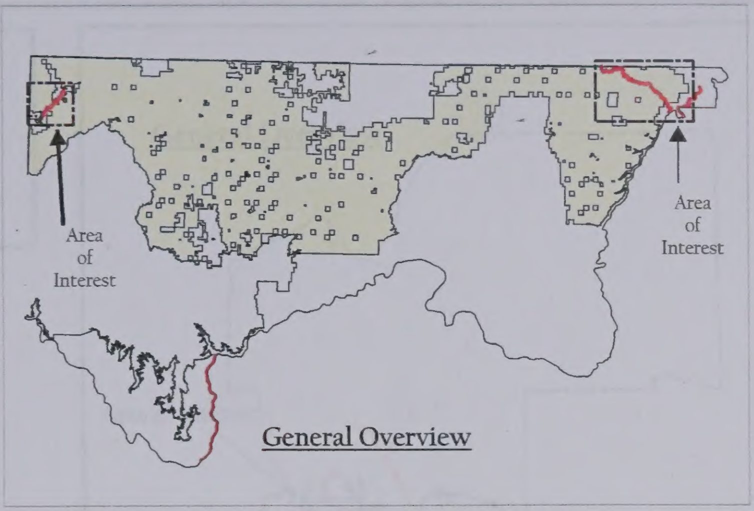
Statewide BLM 2006 Impaired Waters



Mapmaker: Anel Avila
Date: February 27, 2007
Projection: NAD83
*Draft of proposed waters

ADEQ
Arizona Department
of Environmental Quality

BLM Arizona Strip Field Office 2006 Impaired Waters

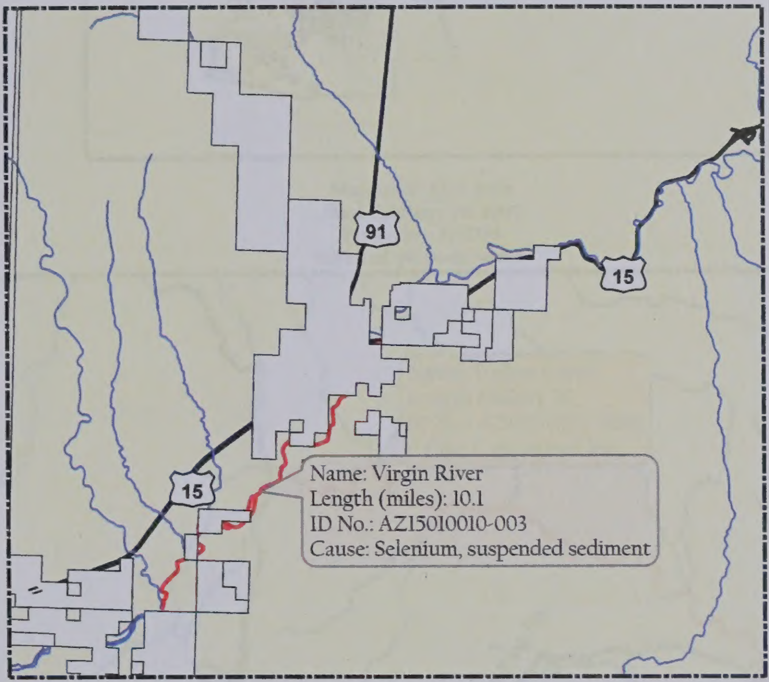


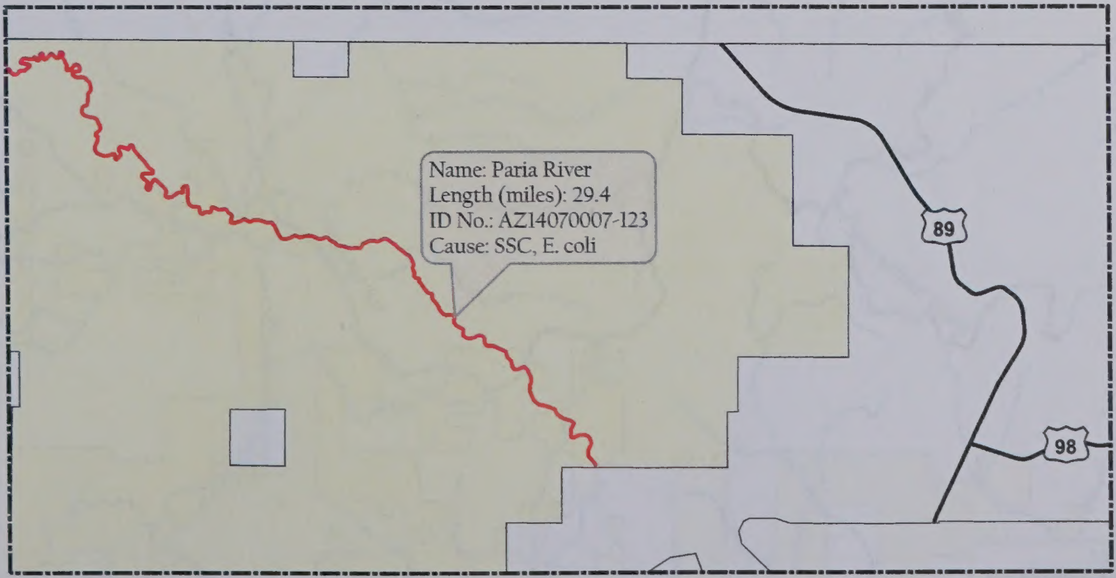
Legend

- ▬ EPA Impaired
- ▬ Not Attaining (Impaired)
- ▬ Impaired
- ▬ Streams
- ▬ Roads
- ▨ Lake
- ☐ BLM

ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 9, 2007
Projection: NAD83
*Draft of proposed waters



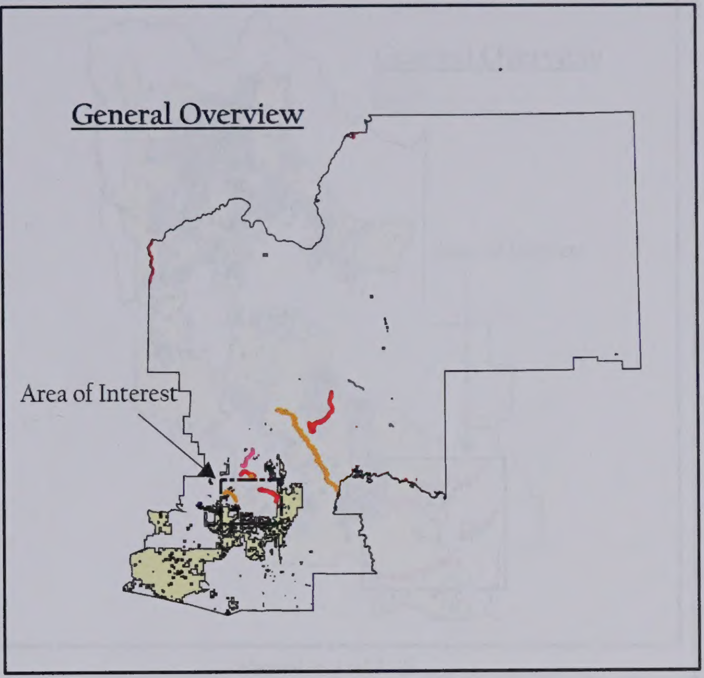


BLM Hassayampa Field Office 2006 Impaired Waters

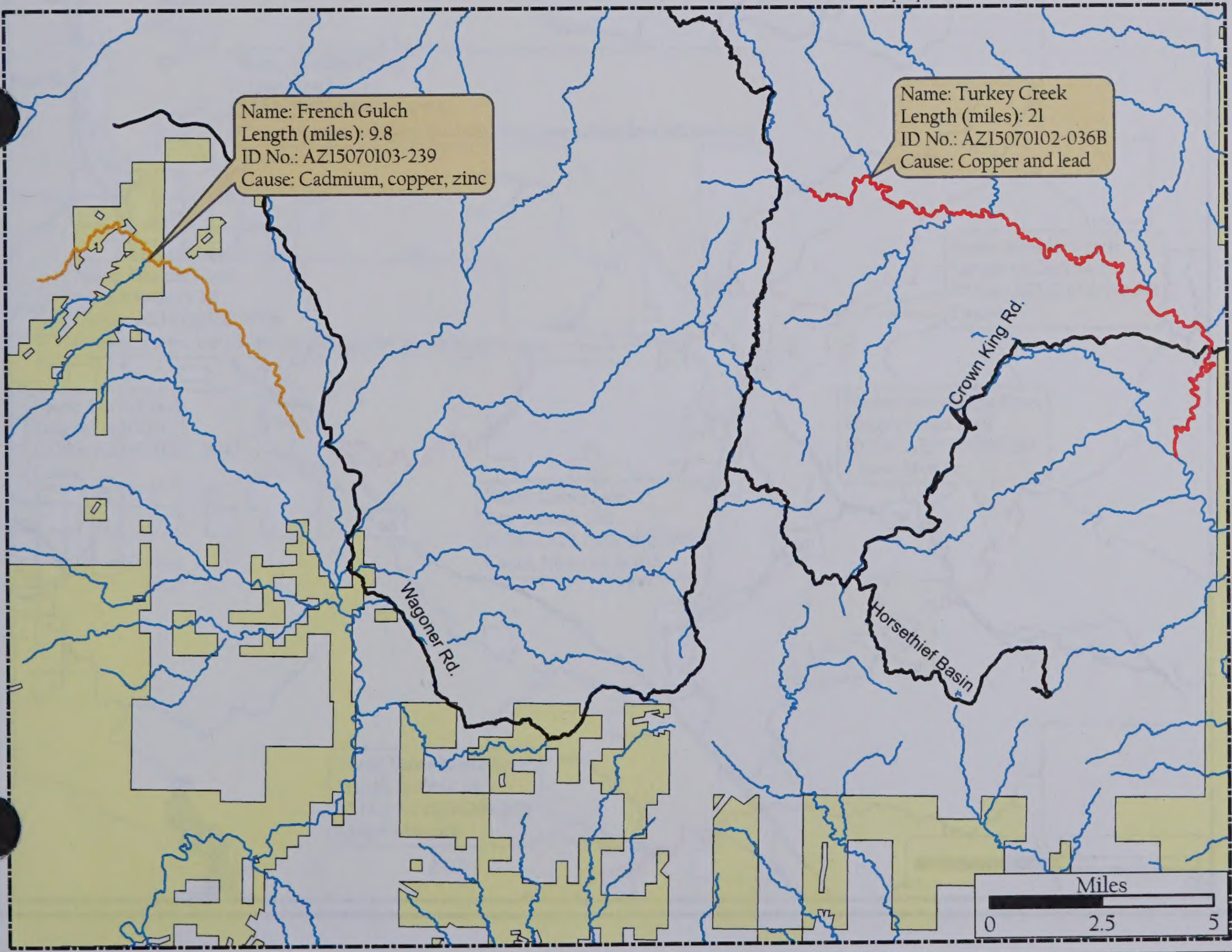
Legend

- — EPA Impaired
- — Not Attaining (Impaired)
- — Impaired
- — Streams
- — Roads
- 🟦 Lakes
- 🟨 BLM

ADEQ
Arizona Department of Environmental Quality


General Overview

Mapmaker: Anel Avila
Date: February 22, 2007
Projection: NAD83
*Draft of proposed waters

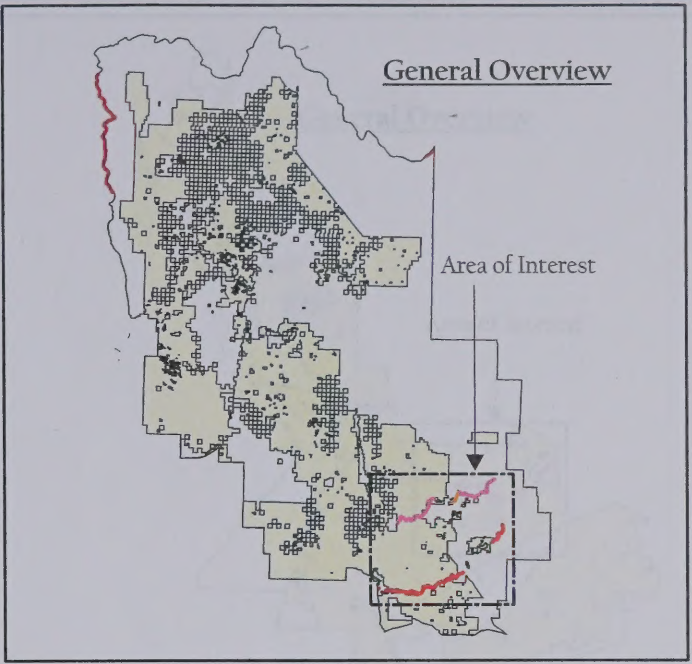

Name: French Gulch
Length (miles): 9.8
ID No.: AZ15070103-239
Cause: Cadmium, copper, zinc

Name: Turkey Creek
Length (miles): 21
ID No.: AZ15070102-036B
Cause: Copper and lead

BLM Kingman Field Office 2006 Impaired Waters

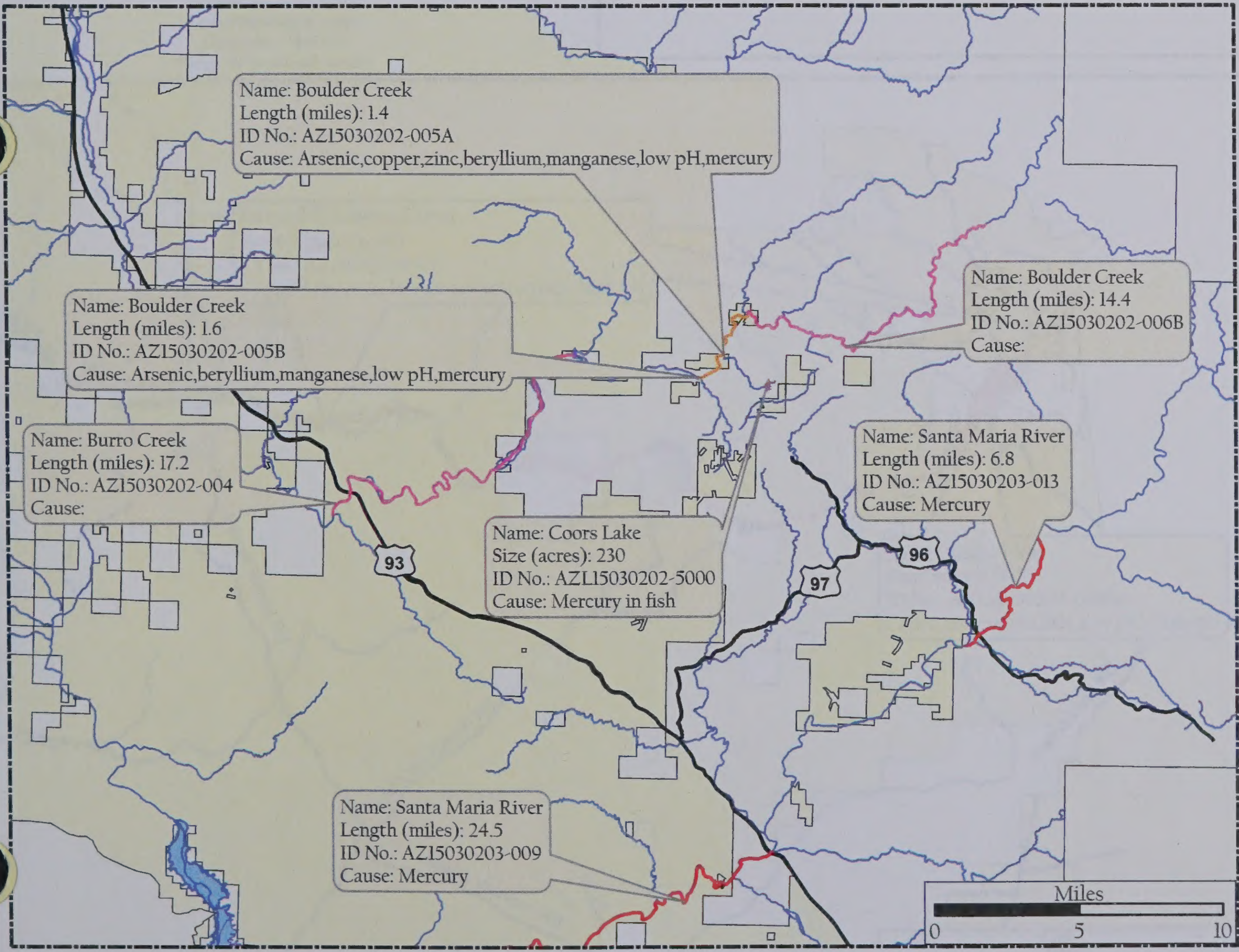
Legend

- EPA Impaired
- Not Attaining (Impaired)
- Impaired
- Streams
- Roads
- 🟦 Lakes
- ▨ BLM



ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 22, 2007
Projection: NAD83
*Draft of proposed waters



Name: Boulder Creek
Length (miles): 1.4
ID No.: AZ15030202-005A
Cause: Arsenic,copper,zinc,beryllium,manganese,low pH,mercury

Name: Boulder Creek
Length (miles): 14.4
ID No.: AZ15030202-006B
Cause:

Name: Boulder Creek
Length (miles): 1.6
ID No.: AZ15030202-005B
Cause: Arsenic,beryllium,manganese,low pH,mercury

Name: Burro Creek
Length (miles): 17.2
ID No.: AZ15030202-004
Cause:

Name: Santa Maria River
Length (miles): 6.8
ID No.: AZ15030203-013
Cause: Mercury

Name: Coors Lake
Size (acres): 230
ID No.: AZL15030202-5000
Cause: Mercury in fish

Name: Santa Maria River
Length (miles): 24.5
ID No.: AZ15030203-009
Cause: Mercury

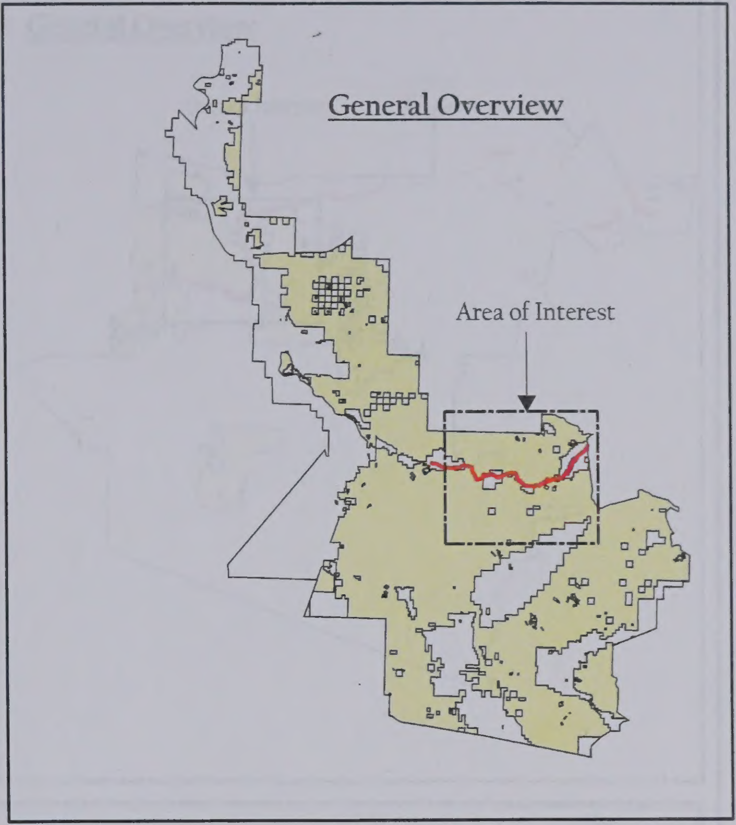
BLM Lake Havasu Field Office 2006 Impaired Waters

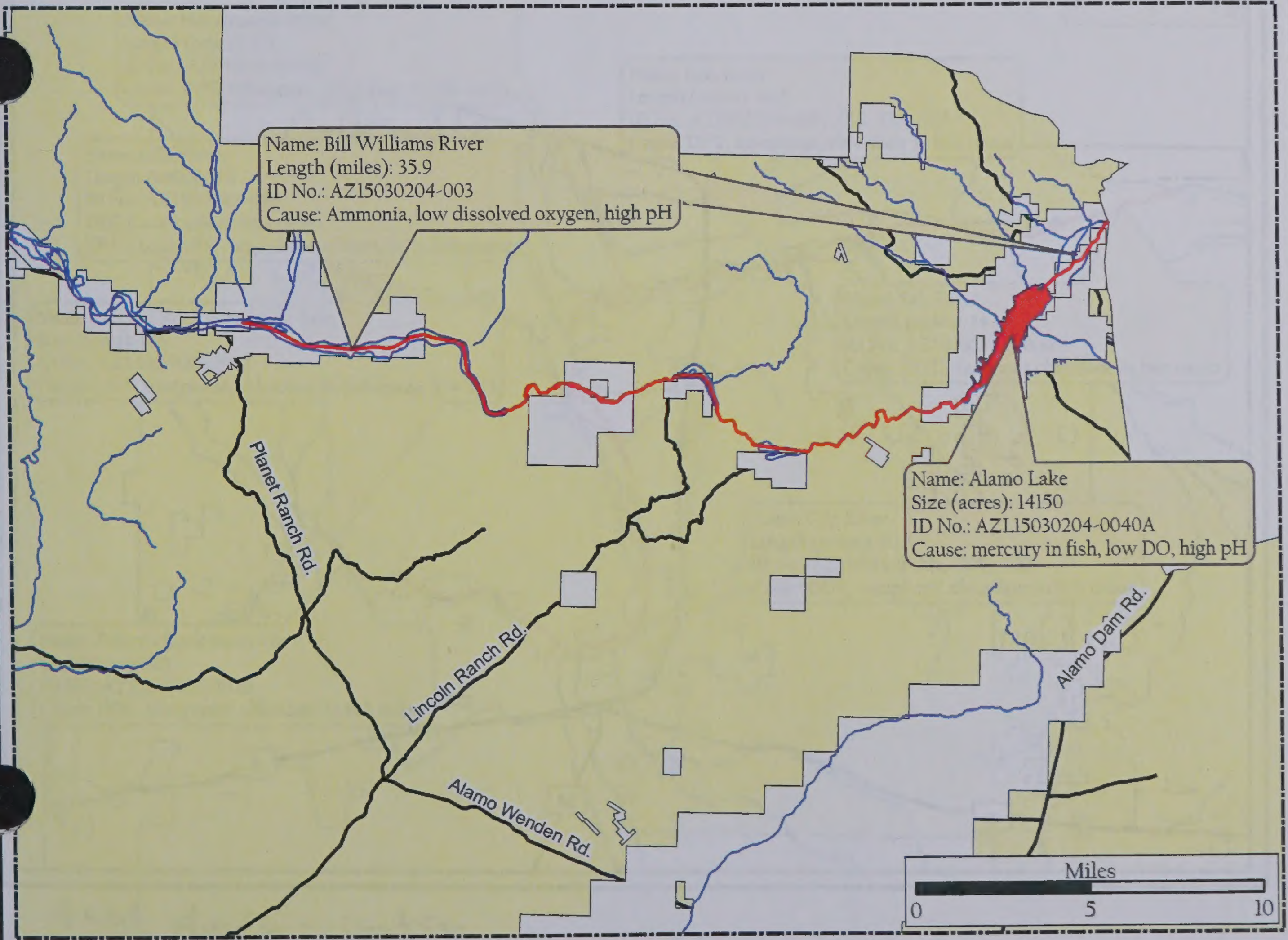
Legend

- EPA Impaired
- Not Attaining (Impaired)
- Impaired
- Streams
- Roads
- Lakes
- BLM

ADEQ
Arizona Department of Environmental Quality

Mapmaker: Anel Avila
Date: February 9, 2007
Projection: NAD83
*Draft of proposed waters

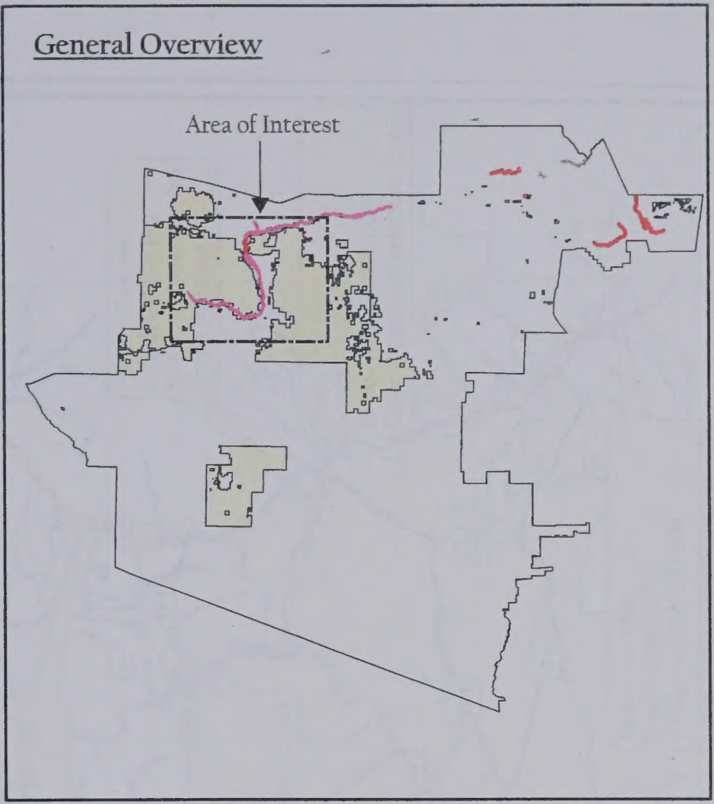



Name: Bill Williams River
Length (miles): 35.9
ID No.: AZ15030204-003
Cause: Ammonia, low dissolved oxygen, high pH

Name: Alamo Lake
Size (acres): 14150
ID No.: AZL15030204-0040A
Cause: mercury in fish, low DO, high pH

BLM Lower Sonoran Field Office 2006 Impaired Waters

General Overview

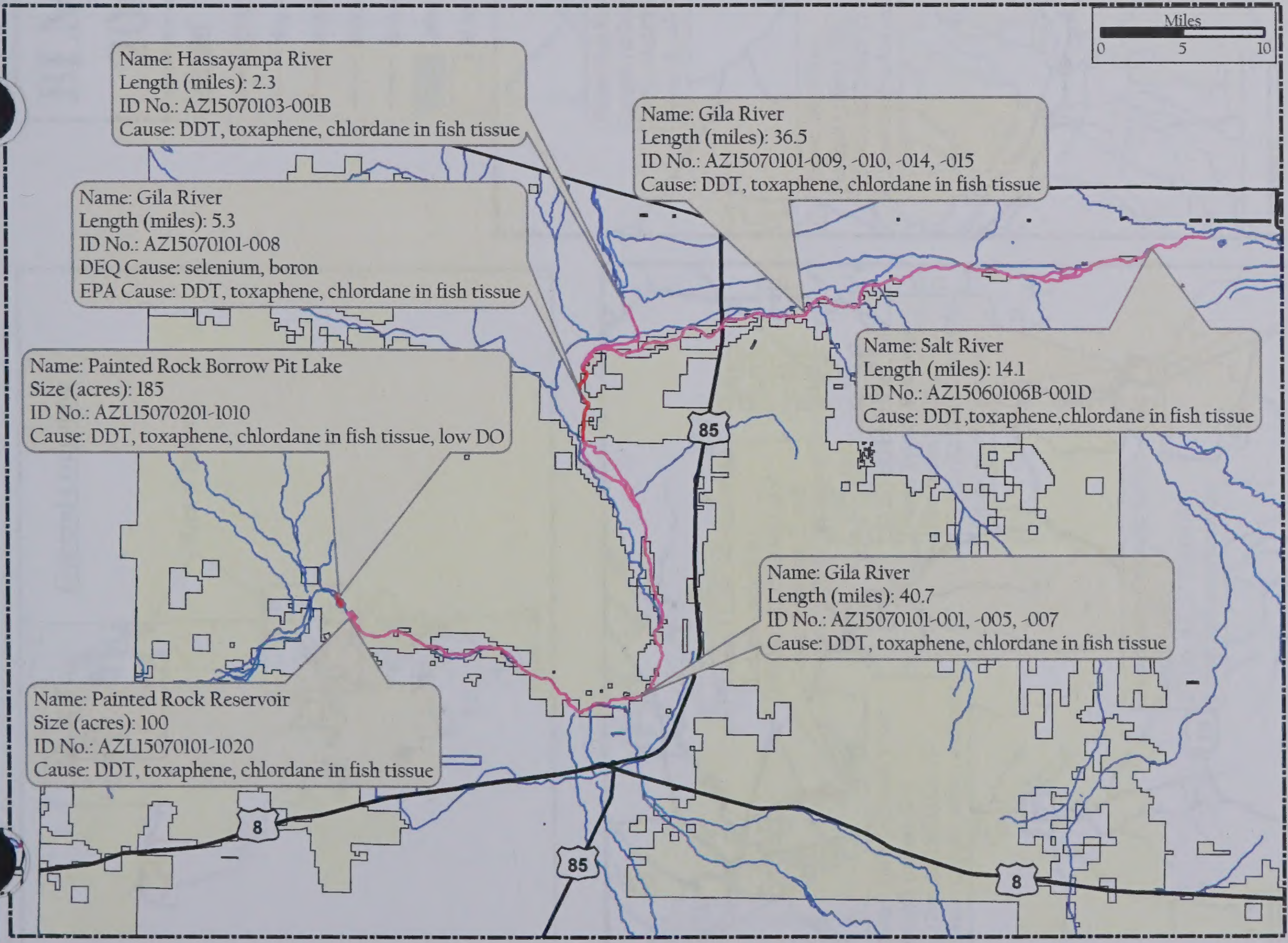


Legend

- EPA Impaired
- Not Attaining (Impaired)
- Impaired
- Streams
- Roads
- 🟦 Lakes
- ▨ BLM

ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 22, 2007
Projection: NAD83
*Draft of proposed waters



Name: Hassayampa River
Length (miles): 2.3
ID No.: AZ15070103-001B
Cause: DDT, toxaphene, chlordane in fish tissue

Name: Gila River
Length (miles): 36.5
ID No.: AZ15070101-009, -010, -014, -015
Cause: DDT, toxaphene, chlordane in fish tissue

Name: Gila River
Length (miles): 5.3
ID No.: AZ15070101-008
DEQ Cause: selenium, boron
EPA Cause: DDT, toxaphene, chlordane in fish tissue

Name: Salt River
Length (miles): 14.1
ID No.: AZ15060106B-001D
Cause: DDT,toxaphene,chlordane in fish tissue

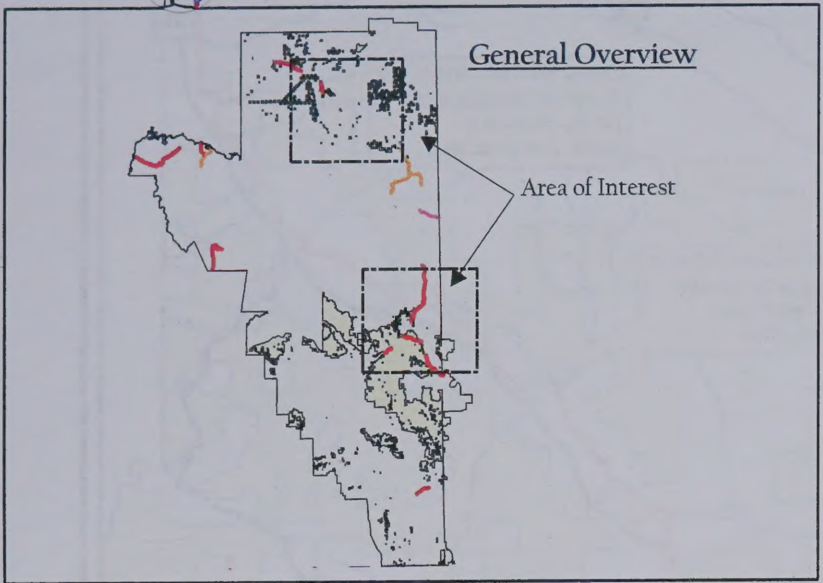
Name: Painted Rock Borrow Pit Lake
Size (acres): 185
ID No.: AZL15070201-1010
Cause: DDT, toxaphene, chlordane in fish tissue, low DO

Name: Gila River
Length (miles): 40.7
ID No.: AZ15070101-001, -005, -007
Cause: DDT, toxaphene, chlordane in fish tissue

Name: Painted Rock Reservoir
Size (acres): 100
ID No.: AZL15070101-1020
Cause: DDT, toxaphene, chlordane in fish tissue

Anel Avila - Inter
Avila, Anel@

BLM Safford Field Office 2006 Impaired Waters

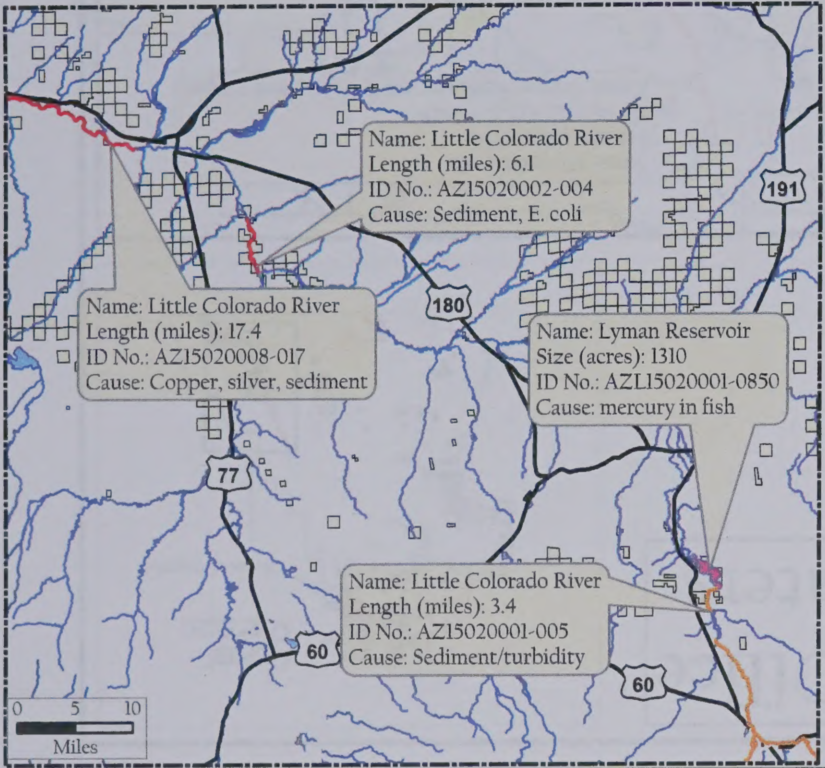


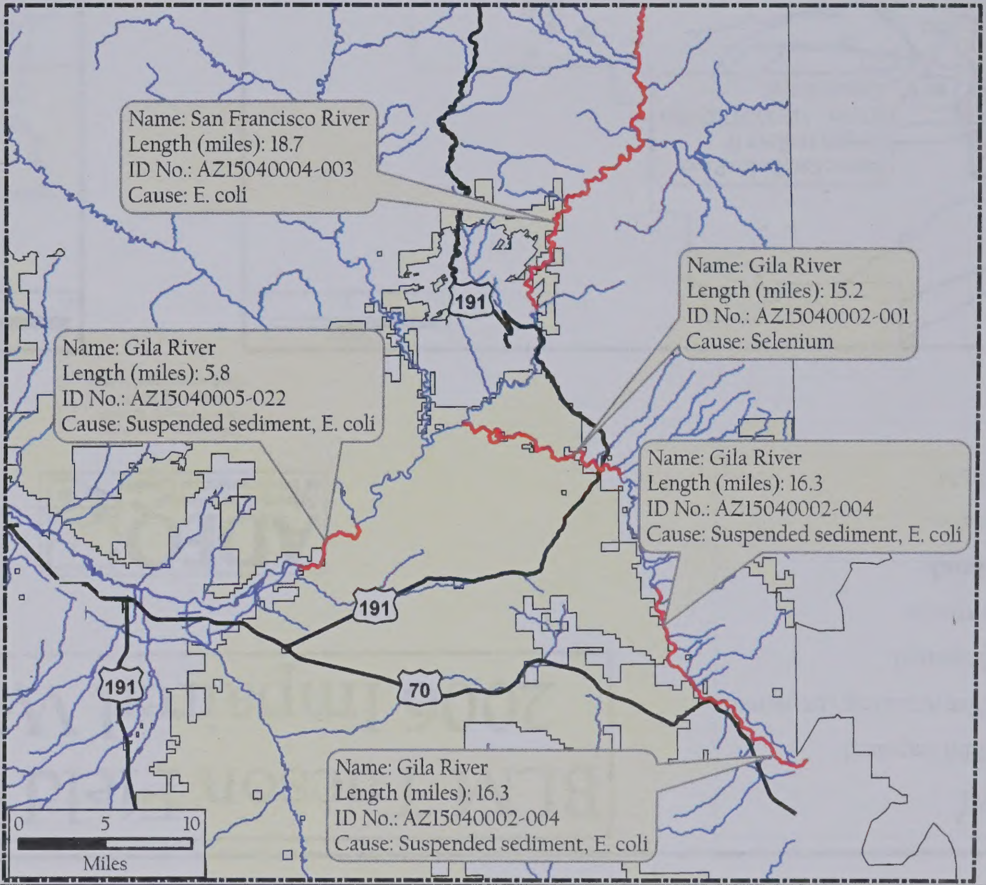
Legend

- EPA Impaired
- Not Attaining (Impaired)
- Impaired
- Streams
- Roads
- Lakes
- BLM

ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 22, 2007
Projection: NAD83
*Draft of proposed waters





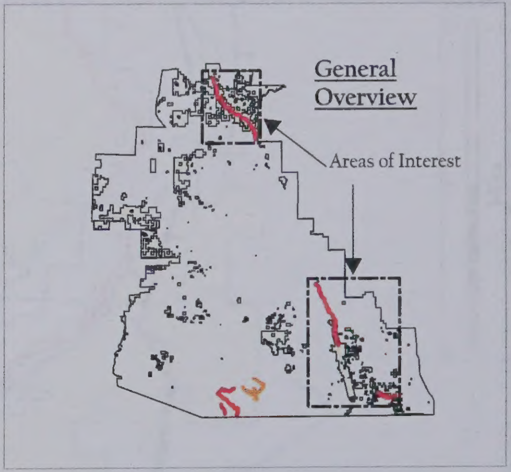
BLM Tucson Field Office 2006 Impaired Waters

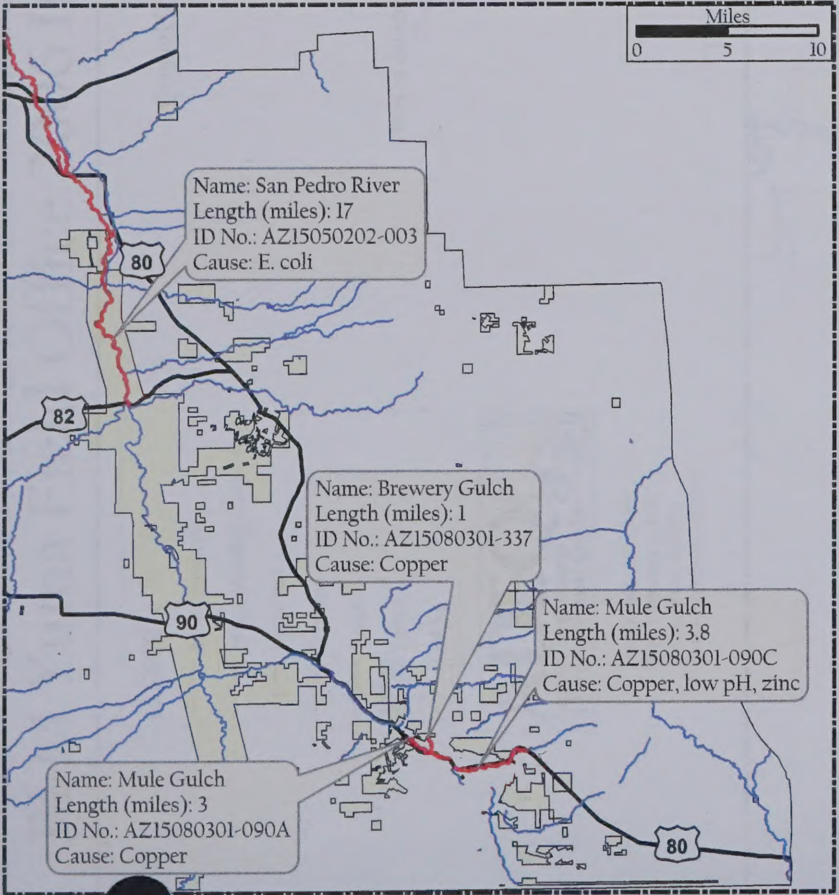
Legend

- EPA Impaired
- Not Attaining (Impaired)
- Impaired
- Streams
- Roads
- 🟦 Lakes
- ▨ BLM

ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 26, 2007
Projection: NAD83
*Draft of proposed waters



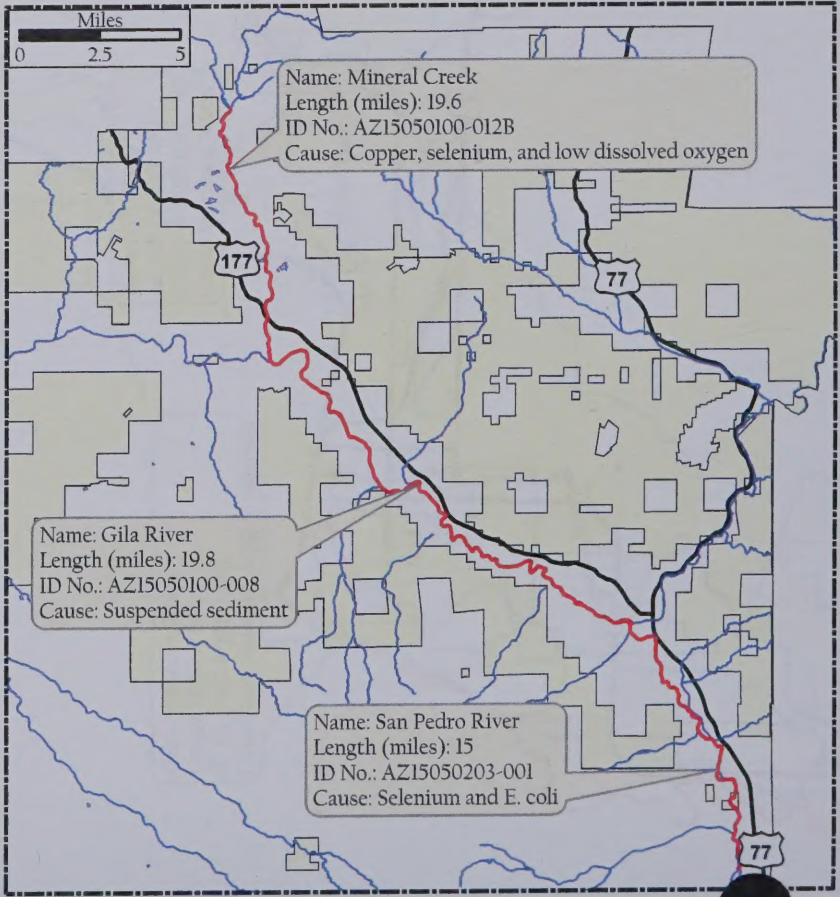


Name: San Pedro River
Length (miles): 17
ID No.: AZ15050202-003
Cause: E. coli

Name: Brewery Gulch
Length (miles): 1
ID No.: AZ15080301-337
Cause: Copper

Name: Mule Gulch
Length (miles): 3.8
ID No.: AZ15080301-090C
Cause: Copper, low pH, zinc

Name: Mule Gulch
Length (miles): 3
ID No.: AZ15080301-090A
Cause: Copper

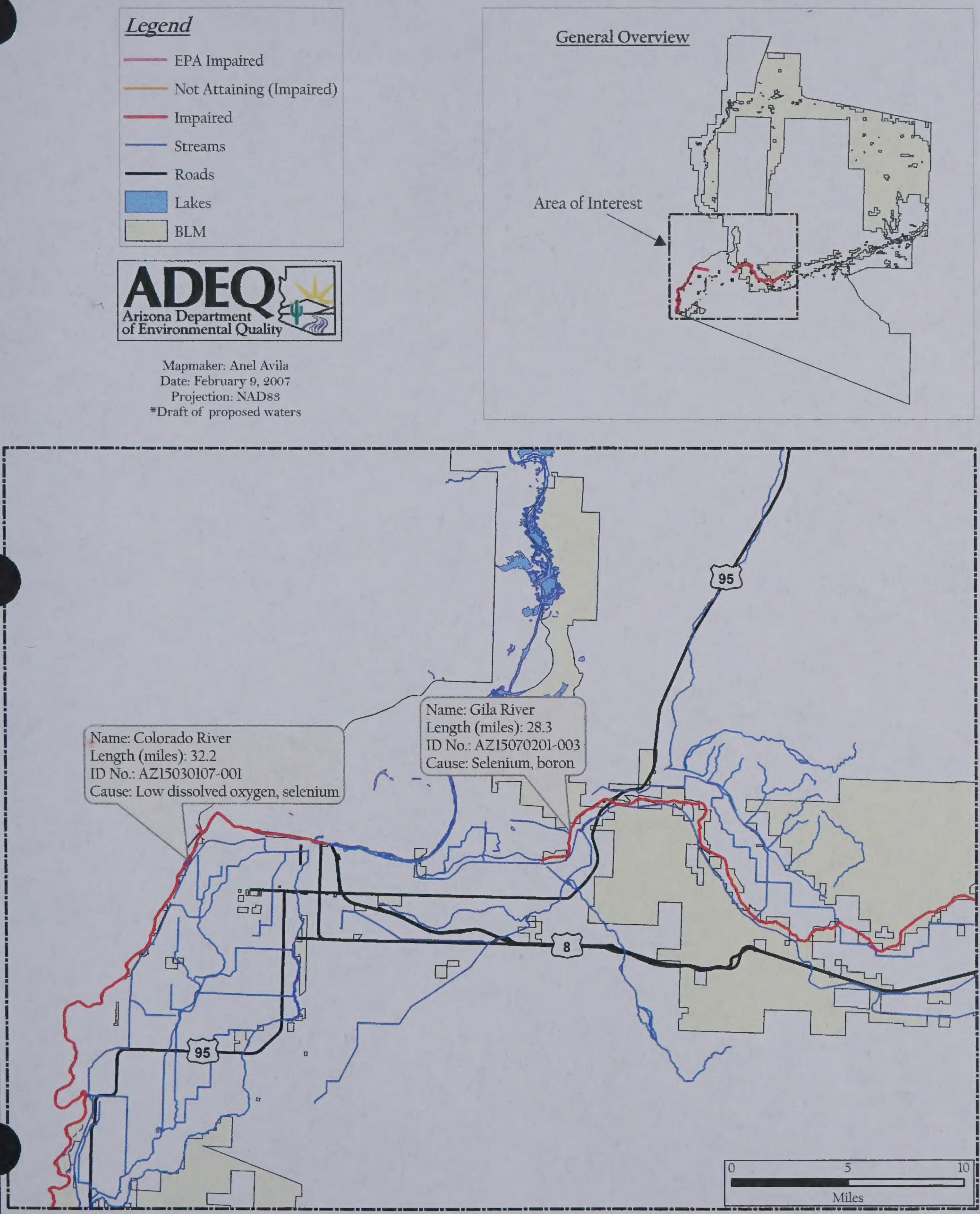


Name: Mineral Creek
Length (miles): 19.6
ID No.: AZ15050100-012B
Cause: Copper, selenium, and low dissolved oxygen

Name: Gila River
Length (miles): 19.8
ID No.: AZ15050100-008
Cause: Suspended sediment

Name: San Pedro River
Length (miles): 15
ID No.: AZ15050203-001
Cause: Selenium and E. coli

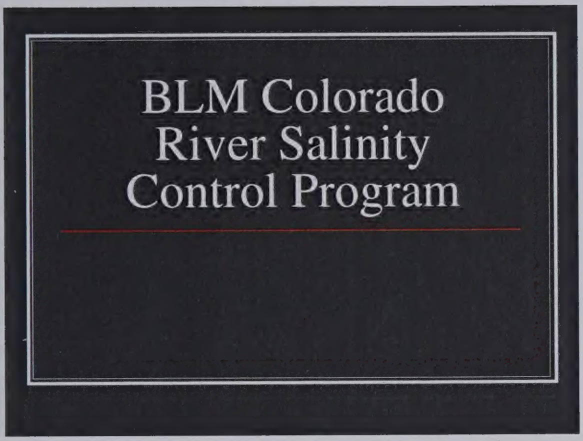
BLM Yuma Field Office 2006 Impaired Waters



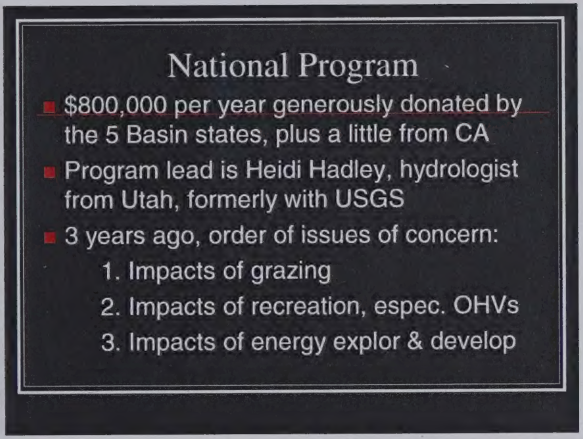
ADEQ
Arizona Department
of Environmental Quality

Mapmaker: Anel Avila
Date: February 9, 2007
Projection: NAD83
*Draft of proposed waters

Salinity

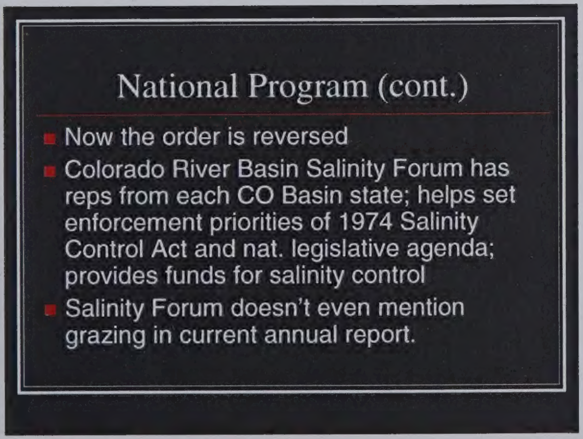


BLM Colorado River Salinity Control Program



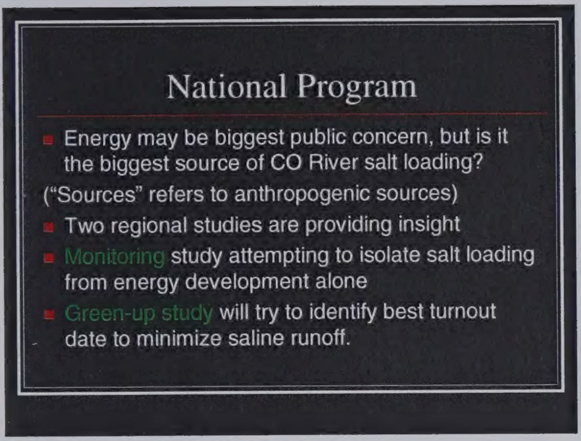
National Program

- $800,000 per year generously donated by the 5 Basin states, plus a little from CA
- Program lead is Heidi Hadley, hydrologist from Utah, formerly with USGS
- 3 years ago, order of issues of concern:
    1. Impacts of grazing
    2. Impacts of recreation, espec. OHVs
    3. Impacts of energy explor & develop



National Program (cont.)

- Now the order is reversed
- Colorado River Basin Salinity Forum has reps from each CO Basin state; helps set enforcement priorities of 1974 Salinity Control Act and nat. legislative agenda; provides funds for salinity control
- Salinity Forum doesn't even mention grazing in current annual report.

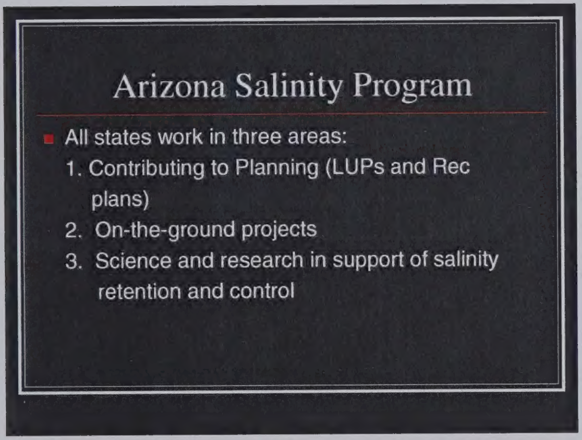


National Program

- Energy may be biggest public concern, but is it the biggest source of CO River salt loading?

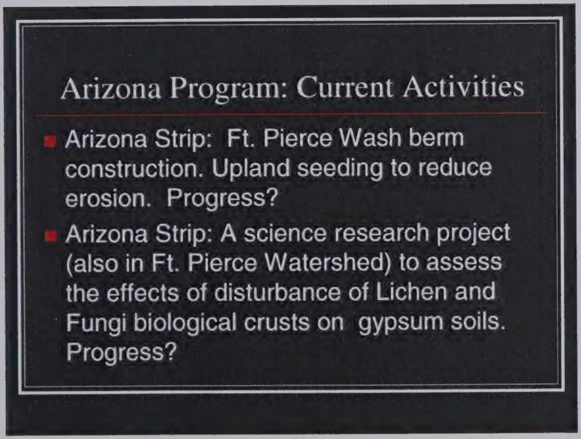
("Sources" refers to anthropogenic sources)

- Two regional studies are providing insight
- Monitoring study attempting to isolate salt loading from energy development alone
- Green-up study will try to identify best turnout date to minimize saline runoff.



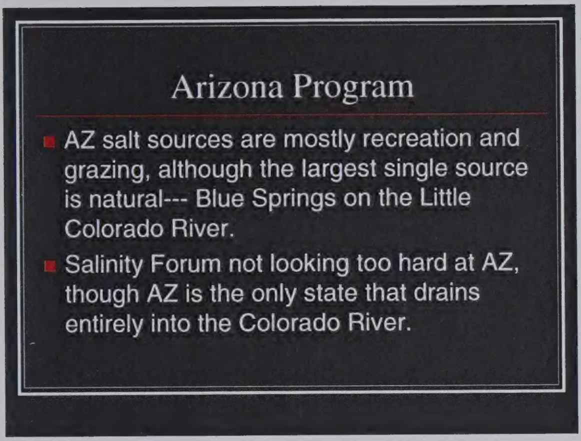
Arizona Salinity Program

- All states work in three areas:
  1. Contributing to Planning (LUPs and Rec plans)
  2. On-the-ground projects
  3. Science and research in support of salinity retention and control



Arizona Program: Current Activities

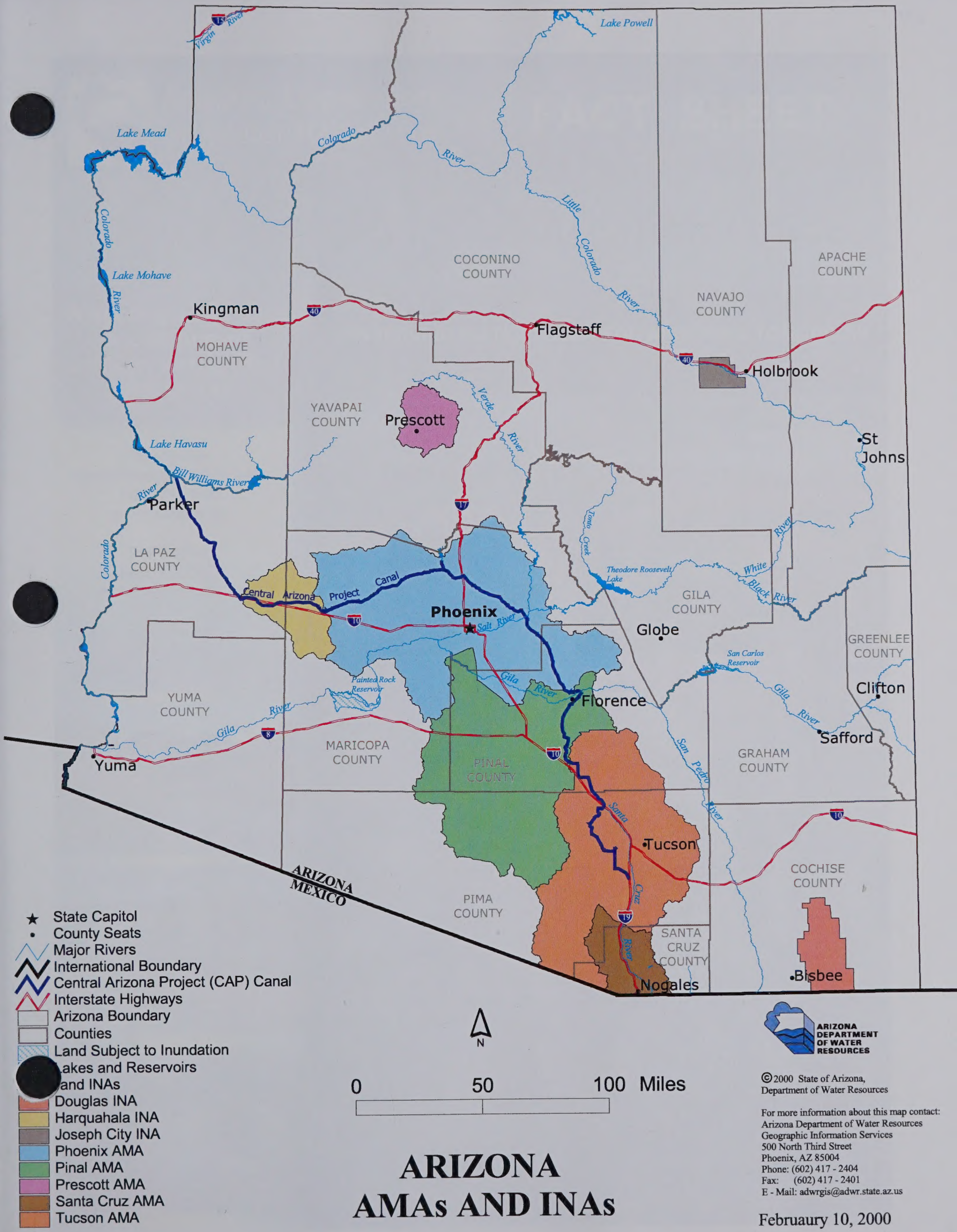
- Arizona Strip: Ft. Pierce Wash berm construction. Upland seeding to reduce erosion. Progress?
- Arizona Strip: A science research project (also in Ft. Pierce Watershed) to assess the effects of disturbance of Lichen and Fungi biological crusts on gypsum soils. Progress?



Arizona Program

- AZ salt sources are mostly recreation and grazing, although the largest single source is natural--- Blue Springs on the Little Colorado River.
- Salinity Forum not looking too hard at AZ, though AZ is the only state that drains entirely into the Colorado River.

AZ Water Permits and Processes



ARIZONA
DEPARTMENT
OF WATER
RESOURCES

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Department of Water Resources

For more information about this map contact:
Arizona Department of Water Resources
Geographic Information Services
500 North Third Street
Phoenix, AZ 85004
Phone: (602) 417 - 2404
Fax: (602) 417 - 2401
E - Mail: adwrgis@adwr.state.az.us

ARIZONA
AMAs AND INAs

Februaury 10, 2000

Arizona Department
of Water Resources

FACT SHEET

Statewide Water Conservation Office

Working to create a culture of conservation for Arizona:

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CONSERVING WATER TODAY FOR ARIZONA'S TOMORROW

We live in a semi-arid state. In a call to action, Governor Janet Napolitano has asked for Arizona residents to adopt a "Culture of Conservation". To this end, the Statewide Water Conservation Office within the Arizona Department of Water Resources is committed to working with communities throughout the state to assess the need for water conservation resources.

The Statewide Conservation Office was formed in 2005 with a goal of expanding the reach of existing programs, create new conservation tools for rural communities, promote water education throughout the state, create guidelines for more efficient use of water, provide suggestions for funding and implement conservation programs.

The Arizona Department of Water Resources and the Statewide Water Conservation Office's approach to conservation can best be described as a three-legged stool: 1) Technology Transfer, 2) Education, and 3) Assistance.

Within this clear policy framework, ADWR focuses its delivery of program and services according to the four pillars. 1) Leadership, 2) Knowledge, 3) Collaboration and 4) Service. Arizona places high priority on managing its water resources to ensure that secure water supplies are available now and well into the future.

PROGRAM BACKGROUND

The Governor's Drought Task Force, established in 2003, developed the *Statewide Water Conservation Strategy* to address drought issues and the need for water conservation. A plan was developed that includes conservation-related recommendations. They are tied to a wide range of conservation programs including a Statewide Water Conservation Office, adopting water conservation "ABCs" for residential and commercial sectors and the use of the best available technologies. The ADWR Statewide Water Conservation Office will work with local communities to assess conservation needs and opportunities for establishing new water efficiency programs.

PROGRAM HIGHLIGHTS

COMMUNITY WATER SYSTEM PLANS

The Arizona Legislature passed House Bill #2277 which requires Community Water Systems to submit to the Arizona Department of Water Resources a System Water Plan. The System Water Plan includes the following 3 components: A Water Supply Plan, A drought Preparedness Plan and a Water Conservation Plan. The Statewide Water Conservation Office will be assisting in conservation plan development and review of the plans once submitted.

WATER EFFICIENCY PROGRAMS

The Statewide Water Conservation Office will encourage the use of the best available technologies for all water use sectors. Arizona Rinse Smart is a new water efficiency program for the food service industry. This program focuses on the replacement of inefficient pre-rinse spray valves with spray valves that use 1.6 gal. per minute or less.

Patch the Pipe is a new leak detection program for the state of Arizona. This program will use digital leak detection equipment to detect lost and Unaccounted for water within a water utility's distribution network.

CONSERVATION PATCH PROGRAM

The Conservation Patch Program is being developed for organized Arizona youth organizations. The goal of the program is to:

- Develop an awareness and understanding of Arizona's water resources
- Understand that water supplies in Arizona are limited
- Understand the need to conserve water for now and future generations
- Understand that wise use of water includes reusing it for different purposes
- Serve the community in the form of water stewardship

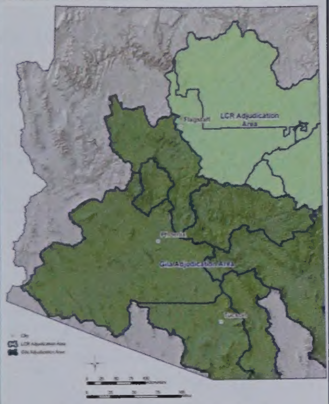
ARIZONA PROJECT WET

The Statewide Conservation Office is a sponsor of **Arizona Project WET**. Arizona Project WET provides Water Education for Teachers throughout the state of Arizona. The curriculum covers the properties of water, the water cycle, watersheds, groundwater, water quality, water rights, as well as understanding of the importance of water to all water users. The Statewide Conservation Office sponsors Arizona Project WET workshops. The workshops provide opportunities to learn about Arizona's water resources by participating in fun, interactive, classroom-ready activities. The Arizona Department of Water Resources, in coordination with Arizona Project WET and the Bureau of Reclamation are developing an **Arizona Conserve Water Educator's Guide**. This guide has K-12 activities for teachers to bring into their classroom. One of the many great qualities of this book is it is Arizona specific.

Arizona Department of Water Resources

FACT SHEET

Stream Adjudications



Arizona Adjudication Watersheds

BACKGROUND

The Superior Court of Arizona is determining the nature, extent, and relative priority of water rights for nearly two-thirds of Arizona, including most Indian reservations and federal lands in the State. Two areas are under active adjudication, containing 11 of the state's watersheds:

- Gila River System and Source (Gila Adjudication) - over 78,000 water right claims filed to date
- Little Colorado River System and Source (LCR Adjudication) - over 13,000 water right claims filed to date

ADWR provides technical, legal, and administrative support to the Court

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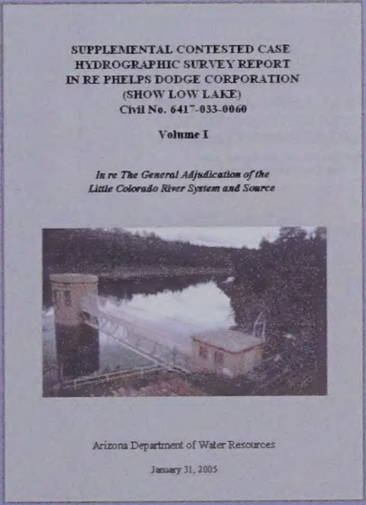
PROGRAM ACCOMPLISHMENTS

2005

- **Hydrographic Survey Report (HSR) for Phelps Dodge's claim** - prepared final supplemental contested case HSR for Phelps Dodge's claims to Show Low Lake and mailed notices to nearly 6,000 claimants in the Little Colorado River (LCR) Adjudication
- **Hopi Reservation agricultural survey** - mapped over 500 fields and numerous ditches and canals, and surveyed 15 of the largest stockponds
- **San Carlos Indian Reservation boundary analysis** - completed in support of settlement negotiations between the tribe and the U.S.
- **Disclosure documents** - developed and maintained an index related to federal reserve right claims filed by the State Land Department for State Trust lands and by the U.S. for Fort Huachuca
- **Statement of Claimants (SOCs) and new use summons** - received and input approximately 1,400 new SOCs and served nearly 2,500 new use summons to potential claimants

2006

- **Mailing list addresses** - updated addresses for nearly 50,000 claimants in the LCR and Gila Adjudications
- **Indian water right settlements** - prepared three technical assessments for the Zuni Tribe in the LCR Adjudication, and the Gila River Indian Community and Tohono O'odham Nation in the Gila Adjudication
- **Hopi Reservation claims and inspections** - analyzed claims to over 1,100 springs, wells, and stockponds and field inspected 179 spring sites, 78 well sites, and approximately 120 stockponds
- **SOCs and new use summons** - processed over 6,500 new SOCs and served over 2,800 new use summons to potential claimants



SUPPLEMENTAL CONTESTED CASE
HYDROGRAPHIC SURVEY REPORT
IN RE PHELPS DODGE CORPORATION
(SHOW LOW LAKE)
Civil No. 6417-033-0060

Volume I

In re The General Adjudication of the
Little Colorado River System and Source

Arizona Department of Water Resources

January 31, 2005

ADWR staff conducting a survey on the Hopi Reservation

CONTACT INFORMATION

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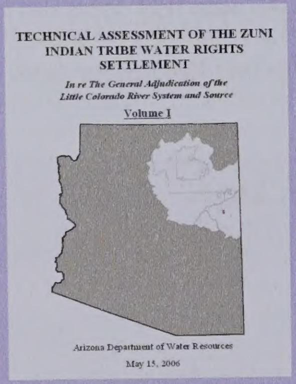
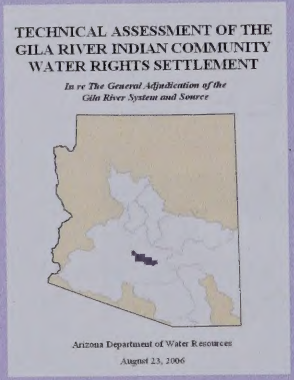
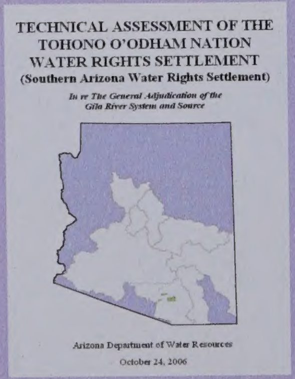

TECHNICAL ASSESSMENT OF THE ZUNI INDIAN TRIBE WATER RIGHTS SETTLEMENT
In re The General Adjudication of the Little Colorado River System and Source
Volume I
Arizona Department of Water Resources
May 15, 2006


TECHNICAL ASSESSMENT OF THE GILA RIVER INDIAN COMMUNITY WATER RIGHTS SETTLEMENT
In re The General Adjudication of the Gila River System and Source
Arizona Department of Water Resources
August 23, 2006


TECHNICAL ASSESSMENT OF THE TOHONO O'ODHAM NATION WATER RIGHTS SETTLEMENT
(Southern Arizona Water Rights Settlement)
In re The General Adjudication of the Gila River System and Source
Arizona Department of Water Resources
October 24, 2006

ADWR staff completed three technical assessments of Indian water right settlements in 2006.

ADWR ROLES AND RESPONSIBILITIES

Technical Support *provided by* Hydrologists Geologists Water Resource Specialists Geographic Information System (GIS) Specialists Historian	• Investigate water right claims and water uses • Publish Hydrographic Survey Reports (HSRs—*see blue box below*) for watersheds and reservations and supplemental HSRs with updated information for particular claims and contested matters • Prepare technical reports addressing special topics such as Indian Water Right Settlements and the subflow issue
Legal Support *provided by* Attorneys Paralegal Legal secretaries	• Appear in court on behalf of the Department for technical, procedural, and legal matters • Direct testimony of ADWR technical staff during evidentiary hearings • Review and analyze legal and technical documents related to adjudications • File legal notices, comments, status reports, and technical documents with the Court
Administrative Support *provided by* Water Resource Specialist Administrative Assistants Clerical support	• Process new, amended, and assigned Statement of Claimants (SOCs) and filing fees, and transfer the SOCs and fees to the Court • Maintain electronic databases with information from new and current SOCs for nearly 50,000 claimants • Mail legal notices to existing claimants and "new use summons" to potential claimants who have initiated new water uses • Maintain Central Information Repository • Respond to inquiries from the public and parties to the adjudications

HYDROGRAPHIC SURVEY REPORTS are comprehensive, multi-volume documents with detailed information and maps regarding water resources, historic and current water uses, and hydrologic analysis of all claims and uses investigated.

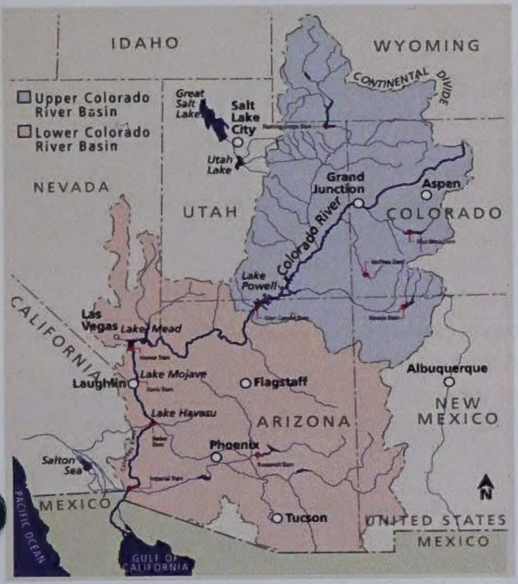
UPCOMING ACTIVITIES

- Research historic streamflow conditions and water uses in the San Pedro River Watershed for future subflow determinations
- Begin detailed mapping of Holocene stream alluvium in the San Pedro area in consultation with the Arizona Geologic Survey
- Continue work on a preliminary HSR for the Hopi Reservation
- Review and file recommendations to the Court regarding 14 springs claimed by the Bureau of Land Management
- Continue managing disclosure documents related to federal reserve right claims for Fort Huachuca and State Trust lands, and provide technical assistance on these matters to the Court and/or settling parties
- Provide technical assistance related to adjudication claims filed by BLM for the San Pedro Riparian National Conservation Area (SPRNCA) as requested by the Special Master
- Continue to serve new use summons, input data from new claims, and update the SOC database

Arizona Department of Water Resources

FACT SHEET

Colorado River Management



BACKGROUND

The Colorado River is shared by seven Western states, the Federal Government, several American Indian tribes and the Republic of Mexico. Arizona obtains nearly 40 percent of its water supply from the Colorado River for municipalities and industries, agriculture, Indian tribes, and environmental purposes. The Arizona Department of Water Resources (ADWR) represents the State of Arizona in policy negotiations of river operations and administration of entitlements. Achieving a careful balance between agricultural, urban, tribal, international and environmental needs is the key to maintaining the long-term availability of Colorado River water supplies.

ADWR is charged with the protection and management of Arizona's allocation of Colorado River water.

……

STRATEGIES TO REDUCE WATER SHORTAGES

The last seven years have been the driest years on record for the Colorado River Basin. ADWR is involved in the following activities to reduce the occurrence and impacts of water shortages to Colorado River water users:

Basin States Water Shortage Planning

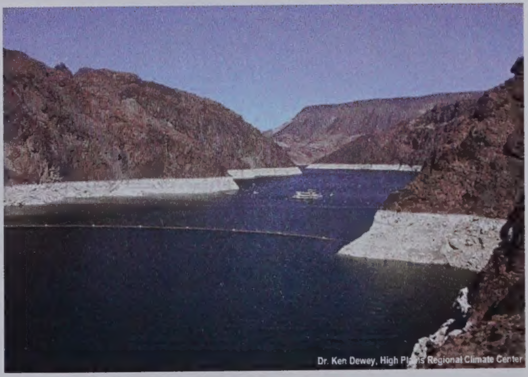
ADWR serves as the lead agency in negotiations with the other six Basin States. Colorado River management strategies are being developed to minimize shortage impacts to the Lower Basin and reduce the risk of water use restrictions in the Upper Basin. Strategies include conservation planning, increased reservoir operation efficiencies and development of additional water supplies.

Arizona Water Shortage Planning

ADWR hosted workshops to develop a recommendation for shortage implementation criteria. The Central Arizona Project and other on-river water users of equal priority developed a shortage sharing strategy that ADWR is drafting to present to the Secretary of the Interior.

Adoption of Federal Administrative Rules

ADWR has worked closely with the Bureau of Reclamation to develop rules and methods to account for all Colorado River water diversions and use in the Lower Basin. ADWR's participation will ensure that all uses are accounted for and that both existing senior and junior priority water rights are not impaired.



Dr. Ken Dewey, High Plains Regional Climate Center

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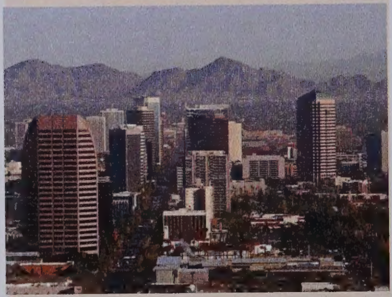
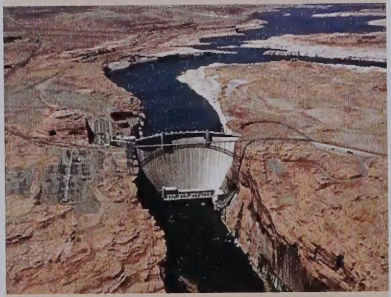
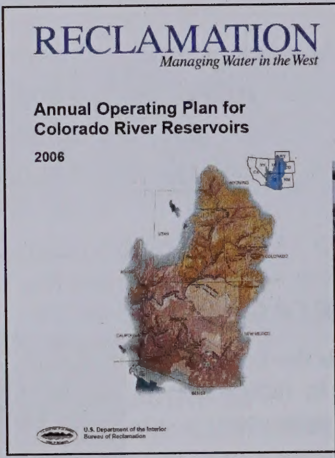
ADWR ROLES IN RIVER OPERATIONS AND MONITORING	
Annual Operating Plan	Consults on development of the Annual Plan designating surplus, shortage or normal water supply conditions.
Long-Range Operating Criteria	Reviews criteria governing the operation of Colorado River reservoirs to determine whether they remain consistent with making continued adequate deliveries to Upper and Lower Basin water users.
Water Use Accounting	Monitors and records water uses in the Lower Basin as required in Article V of the *Arizona v. California* Decree.
Colorado River System Modeling	Models impacts of management strategies, hydrologic conditions and water use demands throughout the Basin to determine the projected amount of Colorado River water available for use in Arizona.
Colorado River Contract Administration	Monitors CAP subcontracted water uses and recommends new reallocations and transfers of CAP water. In 2008, ADWR will begin reallocating up to 96,295 acre-feet of former agricultural CAP water supplies for municipal and industrial water use.







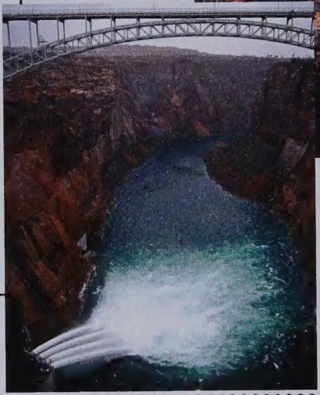
RECLAMATION
Managing Water in the West

Annual Operating Plan for
Colorado River Reservoirs

2006

U.S. Department of the Interior
Bureau of Reclamation

USDA-NRCS



COLORADO RIVER ENVIRONMENTAL PROGRAMS

Lower Colorado River Multi-Species Conservation Program (MSCP)

The MSCP provides f50 years of environmental compliance coverage for our diversions of Colorado River water primarily through implementation of a Habitat Conservation Plan. ADWR represents the State on the MSCP's Steering Committee.

Glen Canyon Dam Adaptive Management Program Work Group

ADWR is a member of the federal advisory group that advises the Secretary of the Interior on the operation of Glen Canyon Dam to protect the resources, including fish and wildlife, in the Grand Canyon.

Colorado River Basin Salinity Control Program

ADWR is the Governor's representative on the Salinity Control Forum and technical work group. The Salinity Control Forum is responsible for implementing and monitoring Upper Basin projects to reduce the amount of salt entering the Colorado River.

Arizona Department of Water Resources

FACT SHEET

Water Management Division
Arizona's Active Management Areas

ATTAIN SAFE-YIELD
INSURE A SUSTAINABLE WATER SUPPLY

The 1980 Arizona Groundwater Code (Code) recognized the need to aggressively manage the state's finite groundwater resources to support the growing economy. Areas of particular interest, due to heavy reliance on "mined groundwater", were identified and designated as "Active Management Areas" (AMAS). Each AMA, with the exception of the Pinal AMA, have a **safe-yield** goal and the expectation that comprehensive and aggressive groundwater management would reverse the trend of heavy groundwater reliance by 2025 or earlier. **Safe-yield is the long-term balancing of groundwater withdrawals in an AMA with the amount of water naturally and artificially recharged to AMA aquifers.**

AMA	*Goal*
Phoenix, Tucson, Prescott	Attain safe-yield by the year 2025
Pinal	Preserve existing agricultural economies for as long as feasible, while preserving future water supplies for non-irrigation uses
Santa Cruz	Maintain a safe-yield condition and prevent long-term local water table declines

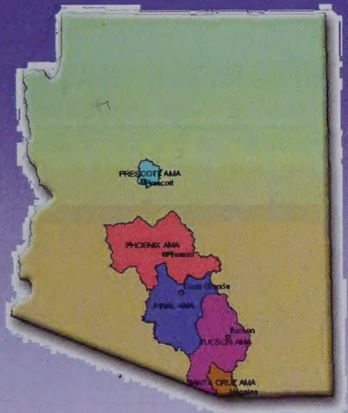
Purpose of AMAs

Arizona's AMAs were established to provide long-term management and conservation of their limited groundwater supplies. In order to accomplish this, the AMAs administer state laws, develop/implement groundwater management plans, explore ways of augmenting water supplies to meet future needs, administer grants programs, and routinely work to develop public policy in order to promote efficient use and an equitable allocation of available water supplies.

Groundwater Management Plans

To assist in achieving the AMA management goals, a series of five management plans would be prepared between 1980 and 2025. These plans would contain progressively more rigorous management requirements for agricultural, municipal and industrial water users. The five management plans cover the following years:

First Management Plan	1980 to 1990
Second Management Plan	1990 to 2000
Third Management Plan	2000 to 2010
Fourth Management Plan	2010 to 2020
Fifth Management Plan	2020 to 2025



Active Management Area Contacts

Phoenix AMA
Mark Frank, Director
(602) 771-8585
mrfrank@azwater.gov

Pinal AMA
Randy Edmond, Director
(520) 836-4857
rledmond@azwater.gov

Prescott AMA
Gerry Wildeman, Director
(928) 778-7202
glwildeman@azwater.gov

Santa Cruz AMA
Alejandro Barcenas, Director
(520) 761-1814
arbarcenas@azwater.gov

Tucson AMA
Kenneth Seasholes, Director
(520) 770-3800
kcseasholes@azwater.gov

Management Tools

Existing management tools include:

- Restrictions on new agricultural land...historic agricultural areas are "grandfathered in". No **new** agricultural areas may be irrigated with groundwater.
- Restrictions on new private lakes beginning in 1987.
- Conservation requirements for cities, towns and private water companies, agricultural water users, and industrial users.
- Conservation and augmentation assistance (financial and technical) to water users.
- Authorities/permits for all groundwater withdrawals.
- Assured Water Supply Program...all new subdivisions must demonstrate 100 years of sustainable water supplies.
- Well measurement requirements and groundwater withdrawal fees.
- Annual water use reporting for all large groundwater users (cities, towns & private water companies, large farms and industries)
- Authority to purchase and retire grandfathered rights.

Conservation Requirements.....Municipal, Industrial, and Agricultural

One of ADWR's more successful management tools has been the development and implementation of mandatory conservation requirements for all users of groundwater within an AMA. Municipal water providers, industrial users and agricultural water users have all been subject to these requirements since the First Management Plan became effective in 1987. The three primary sector-related conservation requirements are summarized below.

Municipal Conservation Requirements

- Each large municipal water provider is assigned an annual total Gallons Per
- Capita Per Day (GPCD) requirement based on that provider's conservation potential.
- Certain large municipal providers have elected to not be regulated by the total GPCD Program and instead have enrolled in alternative programs requiring a groundwater use limitation and the implementation of best management practices.
- Municipal provider distribution system losses are not to exceed 10% annually.

Agricultural Conservation Requirements

- No new agricultural acreage in production.
- Each farm (Irrigation Grandfathered Right) is assigned a maximum annual groundwater allotment, based on assumed irrigation efficiencies of 65 to 80%.
- Certain farms have enrolled in an optional best management practices program.
- Irrigation district distribution system losses are not to exceed 10%.

Industrial Conservation Requirements

- Allotment based requirements for large turf facilities such as golf courses and parks.
- Allotment based requirements for dairies and feedlots.
- Best management practices or design limitations are required of mines,cooling towers, sand and gravel operations, large scale power plants and new large landscape users.

Groundwater User's Advisory Councils

The Code established a five-member, Governor appointed Groundwater User's Advisory Council (Council) for each AMA. Members are appointed to six year terms to represent groundwater users in their respective AMA.. Each Council provides advice and recommendations to the ADWR Director and the AMA Director on the groundwater management programs and policies within the AMA.

Emerging AMA Issues

- **Safe-yield attainment** - given current and projected water demand, available renewable supplies, and current management authorities and strategies, the ADWR will need to reevaluate it's ability to achieve the AMA management goals.
- **Local area management** - even if safe-yield is attained on an AMA-wide basis, local areas within the boundaries of the AMAs could experience significant water management issues, such as groundwater depletions, water logging conditions, and riparian area destruction. This issue needs further consideration.
- **Drought impacts** - The probability of longer term drought and the emerging information on global climate change calls for additional perspectives as we develop future water supply and demand scenarios.

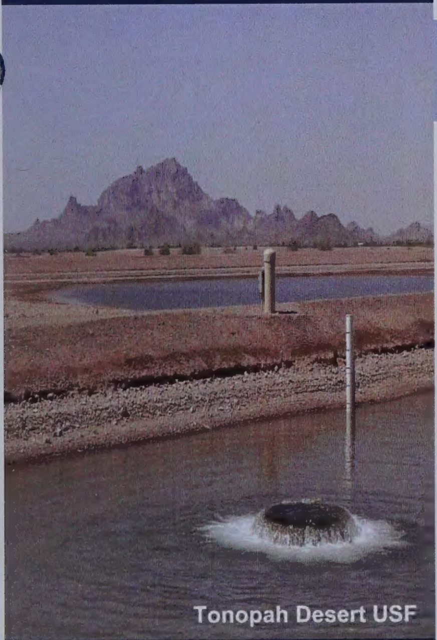
Arizona Department of Water Resources

FACT SHEET

ARIZONA'S RECHARGE PROGRAM

Contact:

Recharge Coordinator
Arizona Department of Water Resources
3535 N. Central Avenue
Phoenix, AZ 85012
(602)771-8585



Tonopah Desert USF

For Additional Information on Recharge in Arizona see:

http://www.azwater.gov/dwr/Content/Find_by_Program/Recharge/default.htm

www.awba.state.az.us

www.cap-az.com

Underground Water Storage, Savings and Replenishment

Beginning in 1986, the Arizona Legislature established laws governing the underground storage and recovery of renewable water supplies. The purpose of this and subsequent recharge legislation was to protect the general economy and welfare of the state by encouraging the use of these water supplies, particularly the state's entitlement of Colorado River water instead of groundwater. These laws provide a flexible and effective regulatory program that allows efficient and cost-effective management of surface water and effluent supplies.

Benefits of Recharge

The recharge and recovery program is an important and effective component in meeting the state's water management goals. Some of the water management benefits include:

- Encourages the use of renewable water supplies rather than continued reliance on finite groundwater supplies
- Reduces overdraft and its impacts such as subsidence
- Utilizes filtration through underlying sediments to improve water quality
- Provides for delivery of CAP, surface water and effluent through storage and recovery, decreasing or eliminating costs of construction of expensive distribution and treatment facilities
- Storage of water in underground aquifers eliminates reservoir construction cost and evaporation
- Provides a mechanism for banking water to assure adequate supplies during times of shortages or disruption of the CAP delivery system

City of Tucson CAVSARP USF

How is Water Recharged ?

The Arizona Department of Water Resources (ADWR) issues and administers the following permits and accounts associated with recharge:

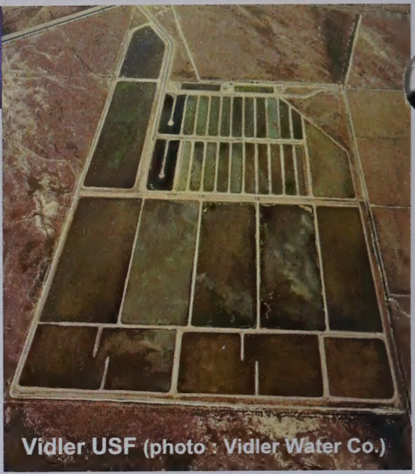
- **Underground Storage Facility (USF)** – There are two general types of USF. A **constructed USF** is a facility which is designed, constructed and maintained to store water underground. These facilities may consist of infiltration basins or trenches that enhance the rate at which water recharges or injection wells which introduce water directly into the aquifer. A **managed USF** is where an artificial and controlled release into a natural stream channel causes CAP or effluent to recharge the aquifer.

- **Groundwater Savings Facility (GSF)** – A GSF is a facility where a recipient such as an irrigation district, uses a renewable water supply (CAP) on a gallon-for-gallon substitute basis in-lieu of pumping groundwater that would otherwise be pumped.

- **Recovery Wells** – Wells meeting particular criteria may be permitted as recovery wells. This status allows a permittee to report and account for withdrawals as having the legal distinction of the water stored water rather than groundwater.

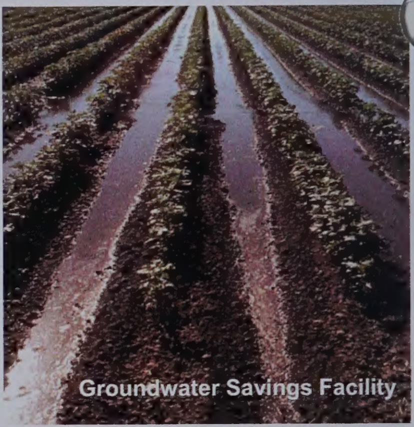
- **Water Storage Permits** – In order to store water annually or earn long-term storage credits, a person must first apply for and obtain a water storage permit from ADWR.

- **Long-Term Storage Accounts** – Accounts containing credits for storage of water recharged at a USF or saved at a GSF are maintained by ADWR. These credits may be recovered by the storer, under certain criteria may be transferred sold or pledged to new development through the Assured Water Supply program.



Vidler USF (photo : Vidler Water Co.)

(Injection Well)
Glendale Arrowhead

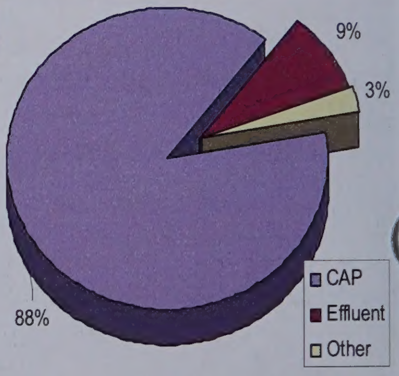


Groundwater Savings Facility

Where? And How Much?

There are currently 81 recharge facilities permitted in Arizona (18 GSFs and 63 USFs). Annual permitted capacities range from 150 acre feet to 200,000 acre feet with combined annual capacities in excess of 2 million acre feet. With access to CAP supplies and regulatory requirements related to conservation and the Assured Water Supply Program, the central Arizona counties of Maricopa, Pinal and Pima account for nearly 99% of all storage.

Total storage (12/31/04)
5.25 Million Acre Feet



ARIZONA
DEPARTMENT
OF WATER
RESOURCES

FACT SHEET

SURFACE WATER RIGHTS PROGRAM

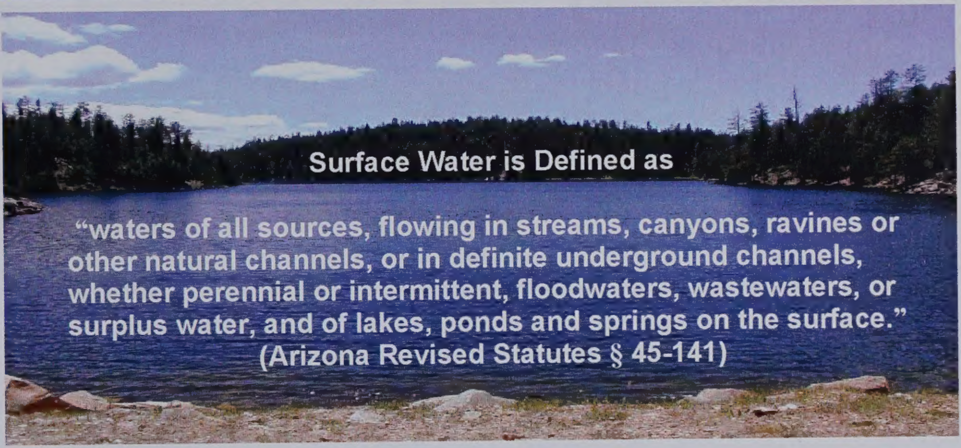
To ensure a long-term, sufficient, and secure water supply for the State by promoting, allocating, and comprehensively managing in an environmentally and economically sound manner the rights and interests of the State's surface water resources for the citizens of Arizona.

Contact

Elizabeth V. Logan, Water Management Support Manager

Arizona Department of Water Resources
Surface Water Right Unit
3535 N. Central Avenue
Phoenix, AZ 85012
(602)771-8500

http://www.azwater.gov/WaterManagement2005/Content/WaterRights/default.htm



Surface Water is Defined as

"waters of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels, whether perennial or intermittent, floodwaters, wastewaters, or surplus water, and of lakes, ponds and springs on the surface."
(Arizona Revised Statutes § 45-141)

Background Information

- **Doctrine of Prior Appropriation** - Early in its history, Arizona adopted the doctrine of prior appropriation to govern the use of surface water. This doctrine is based on the tenet of **"first in time, first in right"** which means that the person who first puts the water to a beneficial use acquires a right that is better than later appropriators of the water.

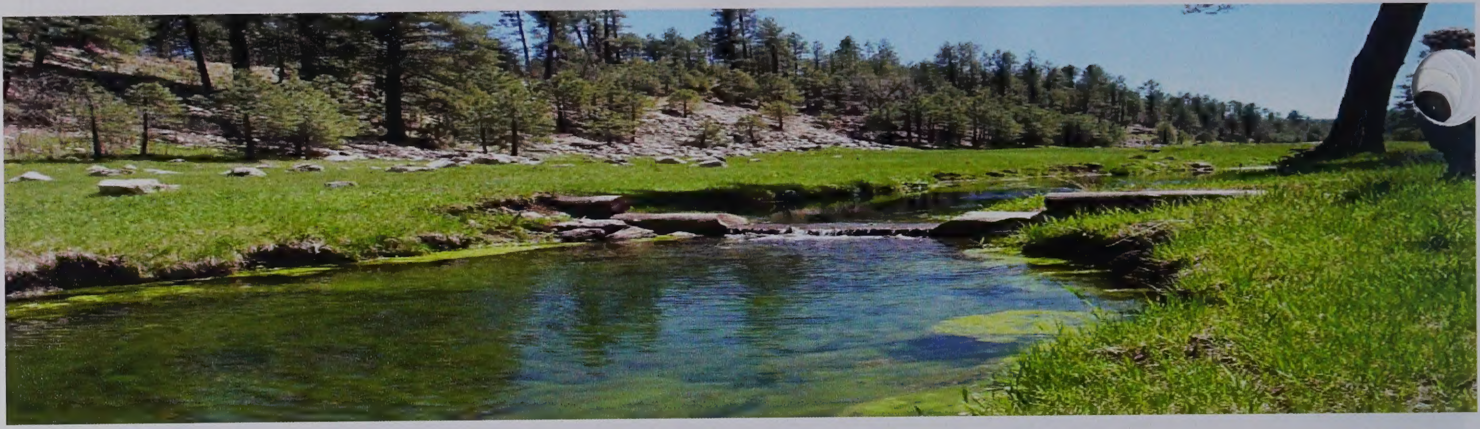
- **Public Water Code** - On **June 12, 1919**, the Arizona surface water code was enacted. Now known as the Public Water Code, this law provides that a person must apply for and obtain a permit in order to appropriate surface water unless:

  1.The water is from the mainstream of the lower Colorado river, in which case a contract with the Secretary of the Interior is required

  2.The person or the person's predecessor-in-interest, lawfully appropriated the water prior to March 17, 1995 and a statement of claim has been filed for the appropriation with the State.

  3.The water is stored in a stockpond constructed after June 12, 1919 and before August 27, 1977 and a claim of right for a stockpond for the appropriation has been filed with the State.

- **Beneficial Use** - The Public Water Code provides that beneficial use shall be the **basis, measure and limit to the use of water** within the state, *A.R.S. § 45-141(B)*. Beneficial uses are: **domestic** (which includes the watering of gardens and lawns not exceeding one-half acre), **municipal, irrigation, stockwatering, recreation, wildlife including fish, nonrecoverable water storage, and •mining** uses, *A.R.S. § 45-151(A)*.



The Arizona Department of Water Resources administers the following applications and claims associated with the surface water program

- Application for Permit to Appropriate Public Water of the State of Arizona or to Construct a Reservoir – Non Instream flow
- Application for Permit to Appropriate Public Water of the State of Arizona - Instream Flow
- Application to Transport Water from the State
- Application to Sever and Transfer
- Claim of Water Right for a Stockpond and Application for Certification
- Statement of Claim of Right to Use Public Waters of the State of Arizona
- Application to Sever and Transfer
- Application for Change in Use
- Request for assignment of surface water applications and claims

Surface Water Right and Claim Statistics

Number of surface water applications (non-instream) filed: 8,335

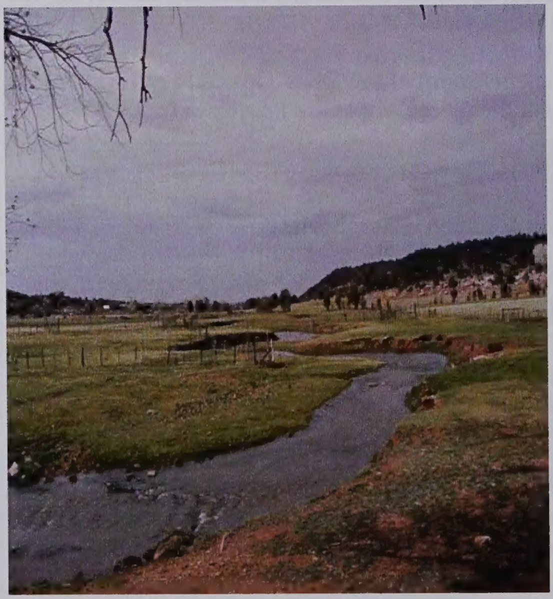
Number of surface water applications (instream flow) filed: 99

Number of Claims of Right for Stockpond filed: 19,398

Number of Statements of Claim of Right filed: 29,489

Primary Customers Include:

Irrigation Districts
Mining Companies
Cities & Towns
Water Providers
Federal & State Agencies
Ranchers & Farmers
Private Individuals & others



The Surface Water Unit provides technical support to numerous sections with ADWR, including:

Assured and Adequate Water Supply
Recharge
Active Management Areas
Water Engineering
Adjudication & Planning Support
Water Protection Fund
Statewide Planning

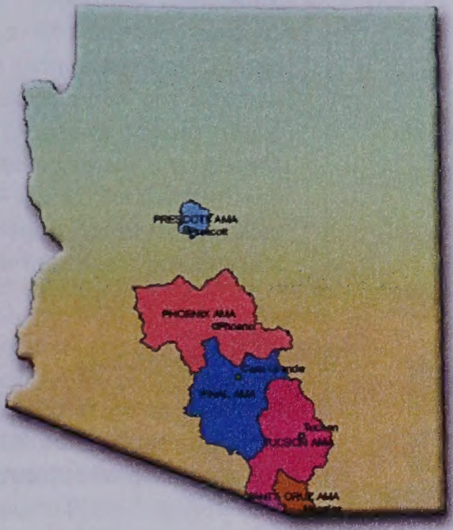
and to others, including:
The Adjudication court
Courts with authority to oversee decreed water rights, and
The Arizona Department of Environmental Quality

Water Adequacy Program Summary

Arizona Department of Water Resources

November 2001

Introduction



Active Management Areas

In 1973, the Arizona Legislature enacted a statewide water adequacy statute as a consumer protection measure in response to the marketing of lots without available water supplies. The Water Adequacy Program, described in A.R.S. § 45-108, requires subdivision developers to obtain a determination from the State regarding the availability of water supplies prior to marketing lots. Developers are required to disclose any "inadequacy" of the supply to potential buyers. This law applies to new subdivisions outside of Active Management Areas (AMAs). New subdivisions within AMAs are subject to the more restrictive Assured Water Supply Program which is summarized in a separate document.

Subdivision Requirements and Water Adequacy

For new subdivisions outside of AMAs, a water adequacy determination is required before a plat can be approved by a city or county. The determination is also needed before the Department of Real Estate will authorize the sale of lots. A subdivision is defined as land divided into six or more parcels where at least one parcel is less than 36 acres. Land divisions resulting in parcels larger than 36 acres are classified as "unsubdivided" lands and do not require a water adequacy determination.

Adequate Water Supply Criteria

Subdivision developers may obtain a water adequacy determination by applying to the Arizona Department of Water Resources (ADWR) for a water adequacy report. If the application successfully demonstrates that sufficient water of adequate quality is available for at least 100 years, the Department will determine the supply to be "adequate." If the supply is determined to be "inadequate," lots may still be sold, though the condition of the water supply must be disclosed in promotional materials and in sale documents.

As an alternative to developers obtaining water adequacy reports for each subdivision, the water provider may acquire a Designation of Adequate Water Supply for an entire service area. If the subdivision will be served by a designated provider, the developer need only obtain a written commitment of service from the provider.

Inside this issue:

Introduction 1

Subdivision Requirements and Water Adequacy 1

Adequate Water Supply Criteria 1

Meeting the Water Adequacy Criteria 2

Applications 2

Assistance 2

Arizona Department of Water Resources

Groundwater Management Division
Office of Assured and Adequate Water Supply
500 N. Third Street
Phoenix, Arizona 85004-3921

Phone: 602.417.2465
Fax: 602.417.2467

Securing Arizona's Water Future

We're on the web!
www.water.az.gov

Meeting the Water Adequacy Criteria

1. Physical, Legal and Continuous Water Availability

Physical availability of the water supply is typically demonstrated through a hydrologic study. For groundwater, the study must consider demands of current and committed uses for a 100 year period, and the supply must meet depth limitations specified in the Assured and Adequate Water Supply Rules. Currently, the depth-to-water cannot exceed 1,200 feet after 100 years for subdivisions served by a water company. For dry lot subdivisions, the maximum depth-to-water cannot exceed 400 feet after 100 years. For all sources of water, legal rights must exist, and adequate delivery, storage and treatment works must be either in place or financed.

2. Water Quality

Proposed sources of water must satisfy existing state water quality standards as well as other water quality standards applicable to the proposed use after treatment.

Applications

A water adequacy report application is filed for a subdivision and must include demand projections, the proposed subdivision plat and a hydrologic study. The application review process typically requires 60 days. If a subdivision plat is not available, an Analysis of Adequate Water Supply may be applied for. The Analysis is used for master plan communities and is a preliminary step toward obtaining a water adequacy report. Water providers may choose to apply for a Designation of Water Adequacy for their entire service area. Applications are available on the Department's website, or can be picked up at our offices.

Assistance

For more information regarding water adequacy determinations, contact the following ADWR offices:

Office of Assured and Adequate Water Supply
(602) 417-2465

Hydrology Division
(602) 417-2448

Arizona Department
of Water Resources

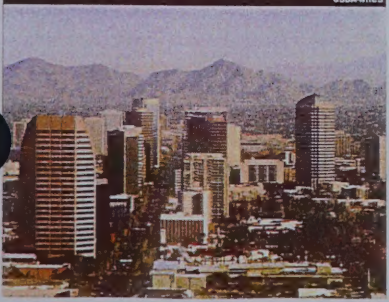
FACT SHEET

Assured and Adequate Water Supply Programs

Office of Assured and Adequate Water Supply

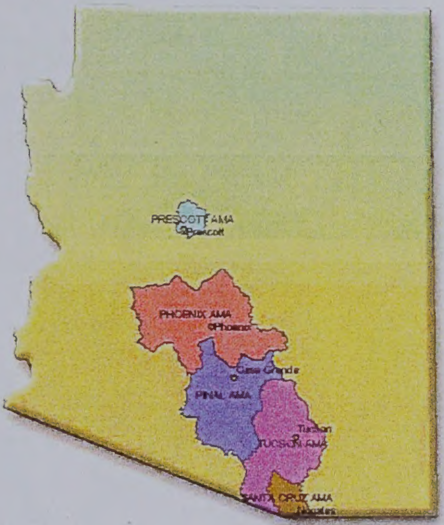
Carlane Stephan
Arizona Department of Water Resources
3550 N. Central Ave.
Phoenix, AZ 85012
(602) 771-8585
wrecs@azwater.gov

www.azwater.gov



ADWR's Assured and Adequate Water Supply Programs were created to address the problem of limited groundwater supplies in Arizona:

- The **Assured Water Supply Program** functions to protect and preserve limited groundwater supplies within Arizona's five Active Management Areas (AMAs). AMAs are those areas of the state where significant groundwater depletion has occurred and include portions of Maricopa, Pinal, Pima, Santa Cruz and Yavapai County.
- Outside the AMAs, the **Adequate Water Supply Program**, while not as protective as the Assured Water Supply Program, acts as a consumer advisory program, ensuring that potential real estate buyers are informed about any water supply limitations.



Applicability

The Assured and Adequate Water Supply Programs apply when a subdivision is being developed, and thus are driven by the definition of a subdivision from the Arizona Department of Real Estate:

A subdivision is six or more parcels with at least one parcel having an area less than 36 acres. This includes residential or commercial subdivisions, stock cooperatives, condominiums, and all lands subdivided as part of a common promotional plan (including golf courses, parks, schools, and other amenities). Short-term leases (12 months or less) and subdivisions where all parcels are greater than 36 acres in size do not fall under this definition.

Both the Assured and Adequate Water Supply Programs are based on demonstration of a 100-year water supply considering current and committed demand, as well as growth projections.

Demonstration of Assured or Adequate Water Supplies

ADWR's **Assured** Water Supply program operates within Arizona's five Active Management Areas. It is designed to sustain the state's economic health by preserving groundwater resources and promoting long-term water supply planning. Before recording plats or selling parcels, developers must demonstrate **all of the criteria in the table to the right.** The Arizona Department of Real Estate will not issue a public report, which allows the developer to sell lots, without a demonstration of an assured water supply.

ADWR's **Adequate** Water Supply Program operates outside the Active Management Areas and was enacted in response to the marketing of lots without available water supplies. Only **the first five criteria** to the right must be demonstrated to obtain a Designation of Adequate Water Supply. State statute requires subdivision developers to obtain a determination from ADWR regarding water supply availability before marketing lots. Inadequacy of supply must be disclosed to potential buyers.

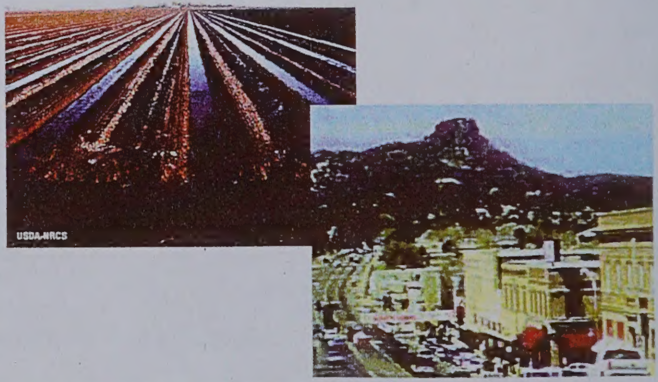
As an alternative to the developer demonstrating an Assured or Adequate Water Supply, the water provider may instead secure a Designation of Assured or Adequate Water Supply for the entire service area. The developer is then only required to obtain a written commitment of service from the provider. The most populous cities within most AMAs have obtained a Designation of Assured Water Supply, thereby qualifying most new subdivisions without need for separate studies.

Criteria	*Description*
Physical water availability	Physical availability of the water supply is typically demonstrated through a hydrologic study. For groundwater, the study must consider demands of area users for a 100-year period, and projected water levels may not exceed depth limitations specified in the rules.
Legal water availability	Legal rights to the water must exist
Continuous water availability	Water providers or developers must demonstrate that the water supply is uninterruptible for the 100-year period, or that sufficient backup supplies exist for any anticipated shortages.
Financial capability	Water providers or developers must demonstrate financial capability to construct the water delivery system and any storage or treatment facilities. Financial capability for developers is typically considered through the local government's subdivision review process.
Water quality	Proposed sources of water must satisfy existing state water quality standards and any other quality standards applicable to the proposed use after treatment.
Consistency with the management goal	Developers or water providers must demonstrate that renewable water supplies will be available.
Consistency with the management plan	Each AMA's Groundwater Management Plan prescribes water conservation requirements for municipal water providers. Water demand associated with proposed subdivisions is evaluated in accordance with these conservation requirements.

Active Management Area Goals

Arizona's 1980 Groundwater Code established management goals for each AMA. The Assured Water Supply Program is a key tool designed to assist in the achievement of these goals.

AMA	*Goal*
Phoenix, Tucson, Prescott	Attain safe-yield by the year 2025
Pinal	Preserve existing agricultural economies for as long as feasible, while preserving future water supplies for non-irrigation uses
Santa Cruz	Maintain a safe-yield condition and prevent long-term local water table declines



"Safe-yield" is the long-term balancing of groundwater withdrawals with the amount of water naturally and artificially recharged to Active Management Area aquifers.

Riparian Resources

Creeks & Communities:

Building Capacity for Collaborative Stewardship

Lander, Wyoming

Challis, Idaho

Prineville, Oregon

Beatty, Oregon

Madera, Chihuahua, Mexico

Enterprise, Oregon

The National Riparian Service Team is working to implement national level policies regarding 'community involvement' and 'collaboration.' Agency policy and planning documents advocate these principles, but often do not provide much guidance on what they mean or how to put them into practice at the field level. As a result, managers and staff may recognize the merits of collaboration but remain unable to orchestrate a collaborative project on their own.

In response to the findings of a 5-year program evaluation, the NRST outlined a framework for encouraging the collaborative stewardship of riparian-wetland resources in the Creeks and Communities Strategy. Rather than a prescription or recipe, strategy implementation rests on a set of principles and practices that give structure to the development of a collaborative process while maintaining the flexibility to respond to site-specific factors and conditions. The NRST has implemented the Creeks and Communities Strategy in a number of locations and in response to a variety of issues. The diverse make-up of the extended Riparian Coordination Network (RCN) is giving rise to the ability to form numerous partnerships thereby enabling the NRST to leverage the resources needed to work across public and private lands.

Under the Creeks and Communities Strategy, the NRST and approximately 150 diverse members of the RCN serve as educators, as well as conveners and facilitators. Although the Creeks and Communities Strategy is focused on riparian-related issues, the model can be applied to a diverse range of site-specific resource issues such as sagebrush and forest health issues, including stewardship contracting and wildland fire planning. In response to a request for assistance, NRST and RCN members form support teams to work with people in their location focusing on their issues. Drawing from a wide range of expertise, support teams use coaching, mentoring and classroom instruction to help agency managers and resource stakeholders develop and engage in collaborative problem solving activities. A key component of the approach is a commitment to placing science in the hands of communities in order to overcome the hurdles of power and distrust that typically surround riparian restoration issues.

The NRST spends a large portion of their time traveling to work directly with people on the land, at their location, focusing on their issues. The place-based nature of this approach enables individuals, communities and institutions to build capacity for collaborative stewardship in connection with an existing

on-the-ground activity or issue ('learning by doing'). Throughout all stages of assistance, the NRST/RCN support teams work one-on-one with agency managers to mentor them through the process of orchestrating a collaborative project (e.g., pre-project interviews, draft invitations/advertisements, information management, meeting design and facilitation, follow-up and strategic planning).

In addition to efforts to build capacity in individual field units, the team's interaction with members of the RCN provides an opportunity for building capacity across an international network of Federal, State, Local, Tribal government employees, university faculty and extension agents, representatives from industry and conservation organizations and private consultants. The NRST is currently in the process of designing a network development strategy to: (1) build an understanding of, and commitment to, 'community involvement' and 'collaboration,' and (2) develop skills needed to convene and facilitate such efforts. Team members are working to develop training and coaching/mentoring opportunities in coordination with the BLM and USFS partnership/collaboration/community stewardship programs.

Project website: http://www.blm.gov/or/programs/nrst

For more information contact:

COOPERATIVE
riparian
RESTORATION

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Creeks and Communities:

A Continuing Strategy for Accelerating Cooperative Riparian Restoration and Management

A strategy for accelerating cooperative riparian restoration and management was initiated in 1996 by the U.S. Department of Agriculture (USDA) Forest Service and the U.S. Department of the Interior (USDI) Bureau of Land Management, in partnership with the USDA Natural Resources Conservation Service. The strategy was designed to integrate the physical, biological, and social dimensions of riparian-wetland management to achieve results for resources and communities. It was based on the premise that as demands on our natural resources increase, the only effective way to ensure the sustainable production of values and benefits is through strong, lasting, public and private partnerships.

Healthy watersheds and riparian-wetland areas are critical to providing communities with the economic, ecological, and social benefits that come from the reliable availability of adequate supplies of clean water. The storage of water in riparian-wetland areas is important to ensuring a life-sustaining supply of this precious resource. Riparian-wetland areas are also unique features that connect landscapes and communities, providing unlimited opportunities to bring people together to create a common vision for productive and sustainable conditions. While there is growing agreement regarding the importance of watershed and riparian-wetland function, there continues to be considerable disagreement about existing conditions and appropriate treatments. This disagreement has led to an environment of lawsuits and regulatory approaches, often leaving out the people most affected by the decisions. However, there is increasing evidence that effective solutions arise from the workings of citizens and stakeholders. This strategy was designed to facilitate collaborative approaches, which take time and are greatly influenced by human dynamics, yet offer the greatest opportunity for managing conflict and reducing excessive process and expense.

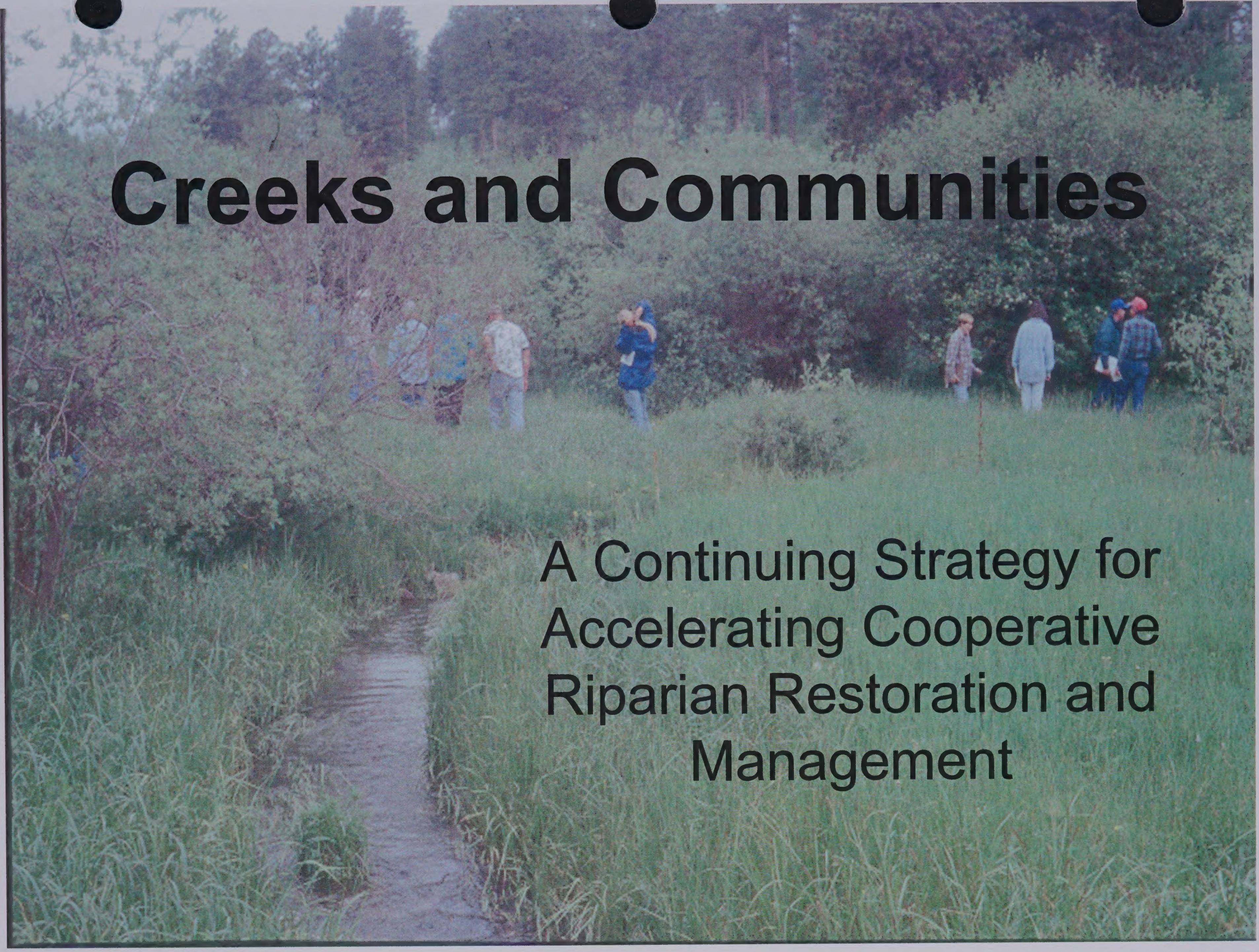
The goals of the original strategy were to achieve riparian restoration through collaboration and to reduce process requirements for restoration and maintenance of riparian-wetland areas. It addressed the need to bring communities of people together and use common vocabulary and definitions for evaluating the health and condition of riparian-wetland areas. It incorporated fundamental concepts from both the biophysical and social dimensions of riparian-wetland management, as reflected in the use of the Proper Functioning Condition assessment method by the Riparian Coordination Network. Through extensive outreach, effort was focused on laying a foundation of understanding across a large number of people, over a broad geographic area and at multiple organizational scales, with the intent of building capacity for better decisionmaking and collective action. Program

evaluation results indicate success in terms of bringing people together and high levels of satisfaction with the products and services provided. However, the degree to which the outreach, training, and assistance have influenced cooperative restoration and management is less evident. Barriers to both implementation and effectiveness have been identified and provide the basis for adaptations focused on those aspects of the approach that will ensure the achievement of intended results as this strategy continues.

In response to the results of the evaluation, elements of the original strategy have been redefined and refined to improve the strategy's effectiveness. The original goals have been blended into a more focused overarching goal, which is to develop a critical mass of people who interact with and manage riparian-wetland resources based on shared knowledge of the attributes and processes that constitute sustainability. In an effort to better guide program decisionmaking and evaluation in the future, the revised plan outlines a number of more specific objectives, strategies, and activities. Combined, they reflect the recognition that while teaching riparian-wetland function to a broad spectrum of people is fundamental to meeting the goal of this strategy, additional emphasis must be placed on strategically building the individual, community, and institutional capacity needed to achieve coordinated management. Extended services will include activities that both precede and follow specific assistance. Additional focus on restoration, management, and monitoring will address a broader range of issues along with drawing on tools designed for situation assessment, conflict management, and consensus building. Emphasis will be placed on diversifying the existing skill base of the Riparian Coordination Network through training and recruitment from various disciplines, as well as from private organizations and communities. Finally, the revised strategy addresses program management and accountability by outlining specific activities that guide overall operations.

Healthy riparian areas provide for the sustainable production of multiple benefits.

The National Riparian Service Team can be contacted at 541-416-6700 or email: nrst@or.blm.gov

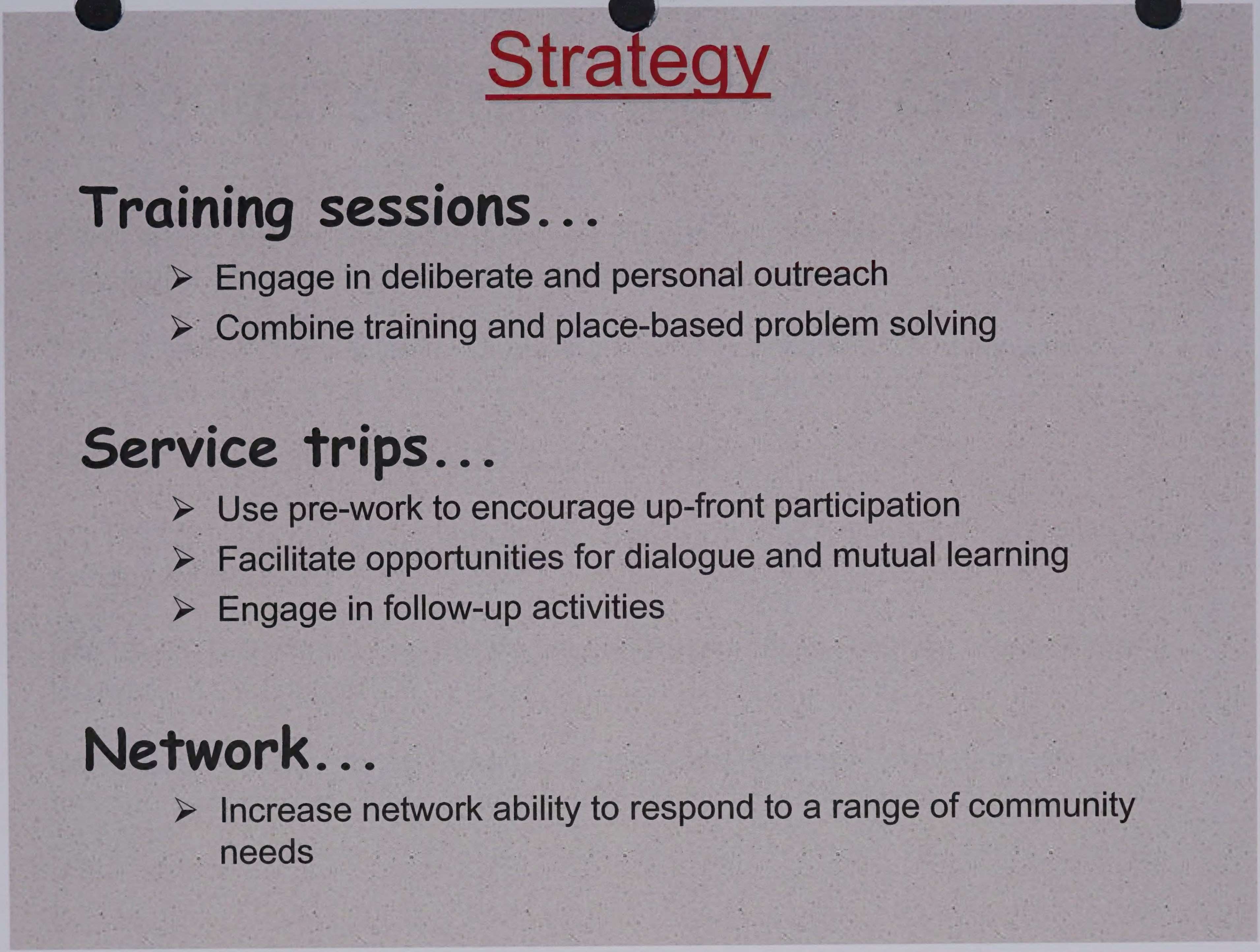


Creeks and Communities

A Continuing Strategy for Accelerating Cooperative Riparian Restoration and Management

The Initiative for Accelerating Cooperative Riparian Restoration and Management

- Created in 1996
- BLM, USFS, NRCS
- Program mission
- Program philosophy
- Program goal
- Program tool



Strategy

Training sessions...

- ➢ Engage in deliberate and personal outreach
- ➢ Combine training and place-based problem solving

Service trips...

- ➢ Use pre-work to encourage up-front participation
- ➢ Facilitate opportunities for dialogue and mutual learning
- ➢ Engage in follow-up activities

Network...

- ➢ Increase network ability to respond to a range of community needs

Products/Information Sources

TR 1737-15: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas (1998) (PDF)

TR 1737-16: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas (1999, Revised 2003) (PDF)

TR 1737-19: Riparian-Wetland Soils (2003) (PDF)

TR 1737-20: Grazing Management Processes and Strategies for Riparian-Wetland Areas. (2006) (PDF)

RMRS-GTR-47: Monitoring the Vegetation Resources in Riparian Areas (Alma Winward, April 2000) (PDF)

ID-TB-2007-01: Monitoring Stream Channels and Riparian Vegetation - Multiple Indicators (*http://www.blm.gov/id/st/en/info/publications/technical_bulletins/tb_07-01.html)*

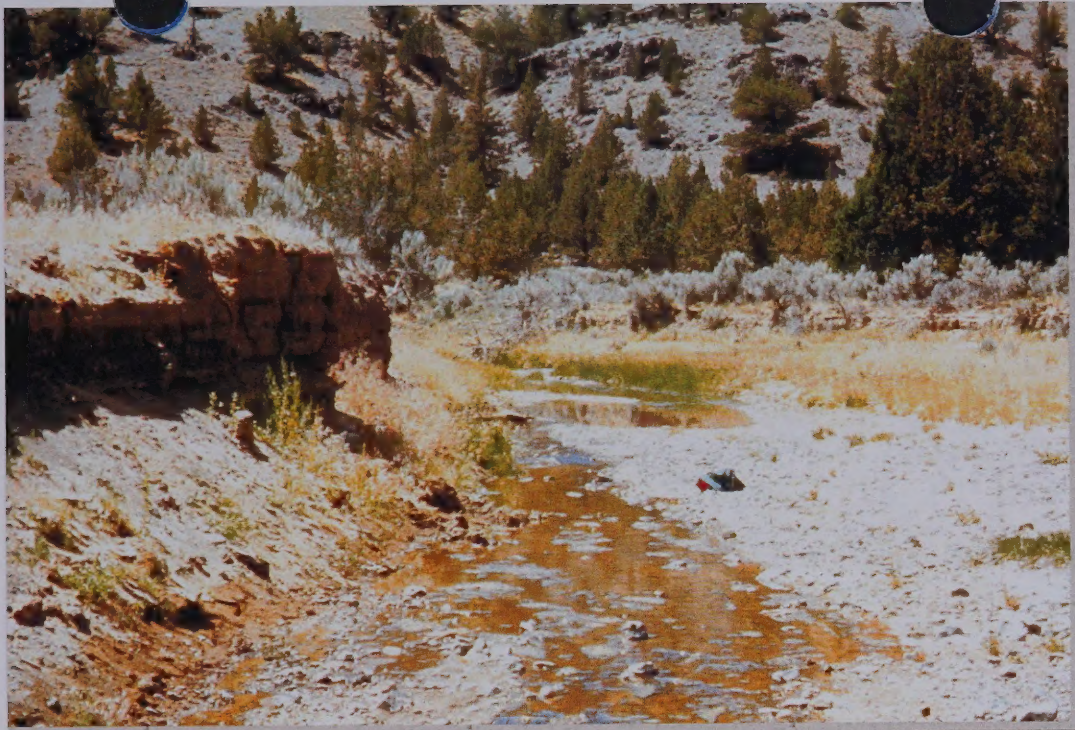
NRST

http://www.blm.gov/or/programs/nrst/index.php

NSTC Library

http://www.blm.gov/nstc/library/techref.htm

Working Together for Creeks and Communities

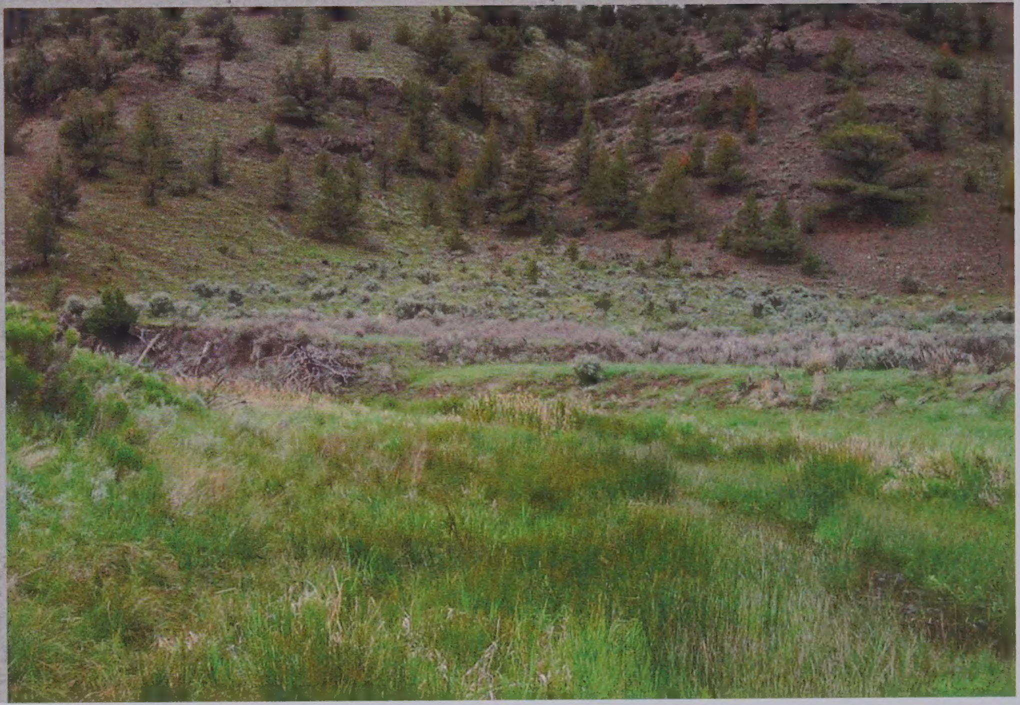


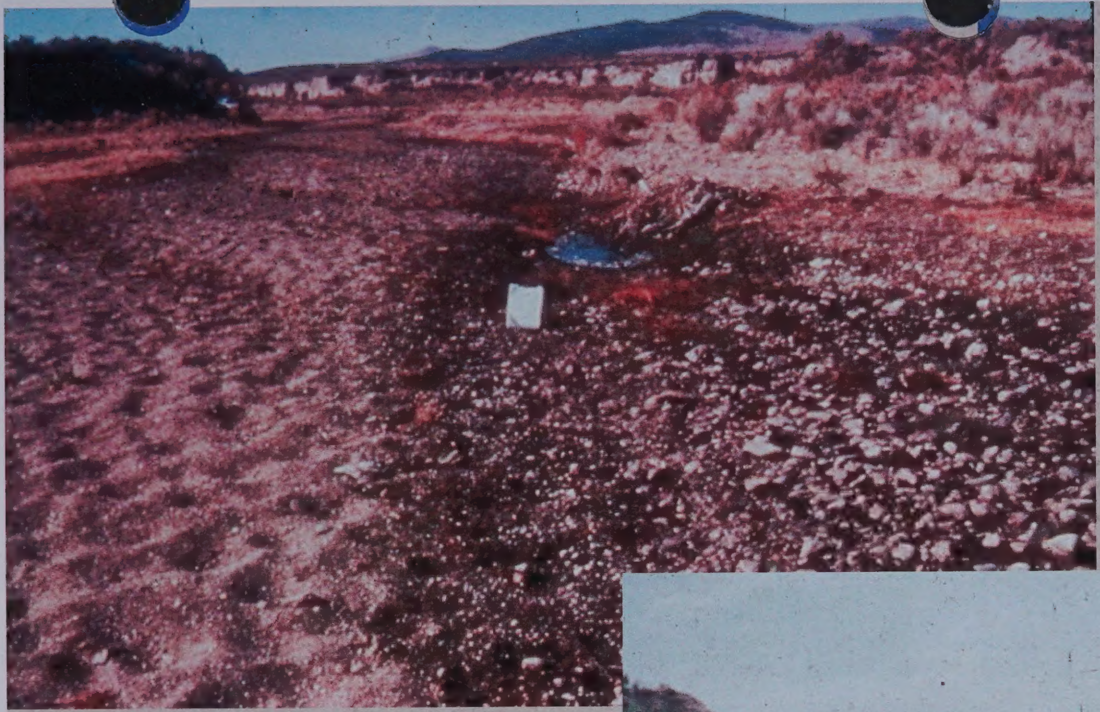
Bear Creek OR 1976

Lots of creeks look like this

We know they can be better

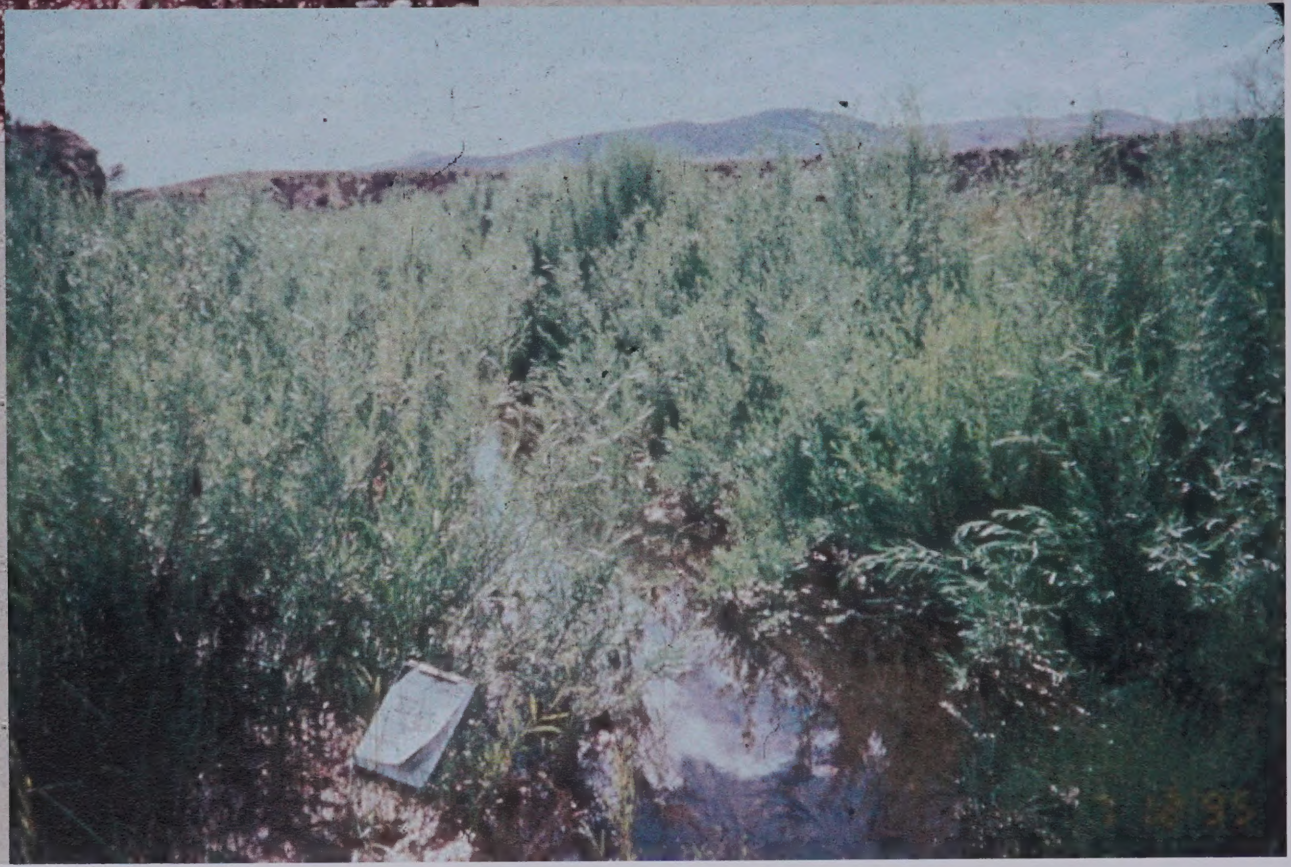
Bear Creek OR 2003





Dixie Creek
NV 1989

Why isn't it happening in more places?



Dixie Creek
NV 1995

Our society is literally awash today in data, information & knowledge (science). And yet in many places our creeks are failing to produce the values they offer when healthy.

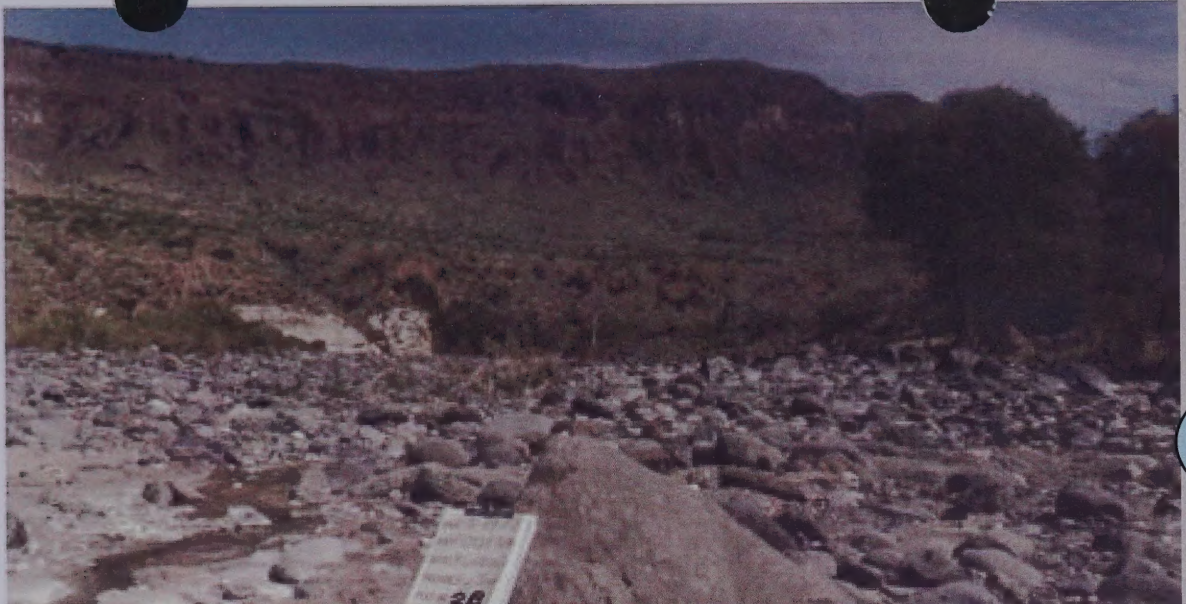
What is often lacking is fully understanding what it all means, and then having the wisdom to apply what we know in ways that best meets the needs of people and the ecosystem.

(Dee Hock 1999)

Good Science is Important: *and seldom enough*

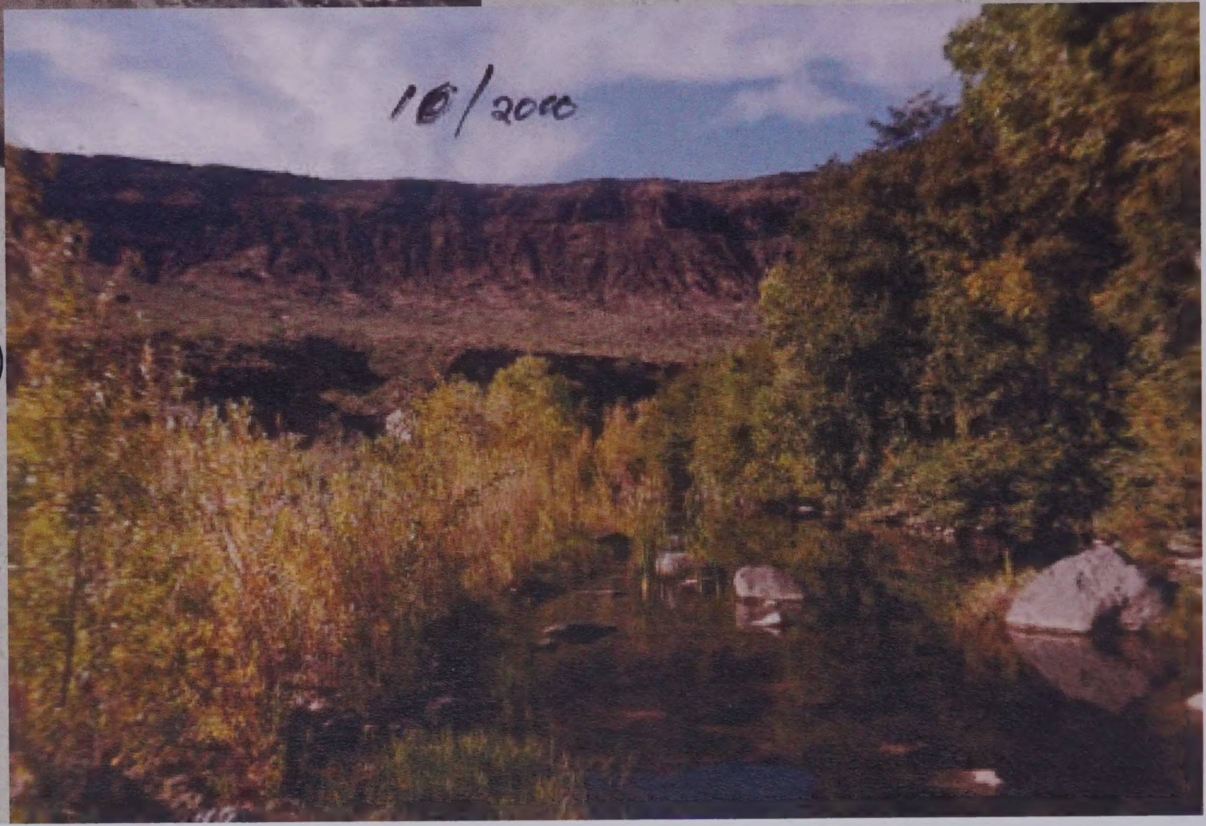
- Conflicting Science
- "Good Science" changes over time.
- Science from somewhere else.
- Socio/Political factors important
- Science provides information, not solutions.

Burro Creek
AZ 1981



In part, it's about common understanding of how streams work.

And it requires working with people on their lands and their issues.



10/2000

Burro Creek
AZ 2000

“Information does not resolve social conflicts, people do.”

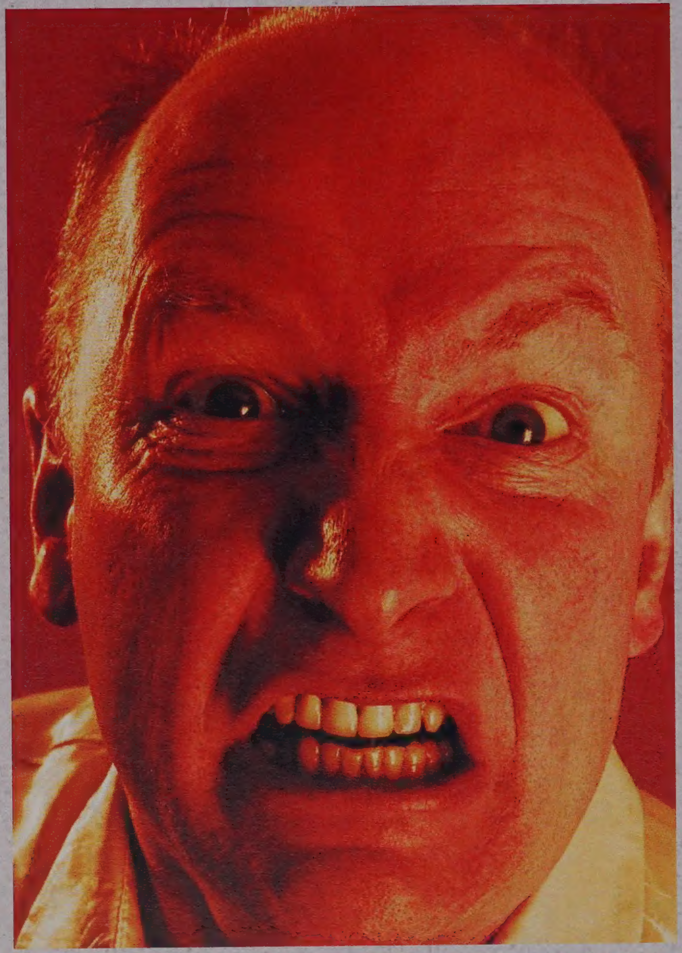
(Duane 1997)

If you bring together the right people, in constructive ways, with good information, they will produce:

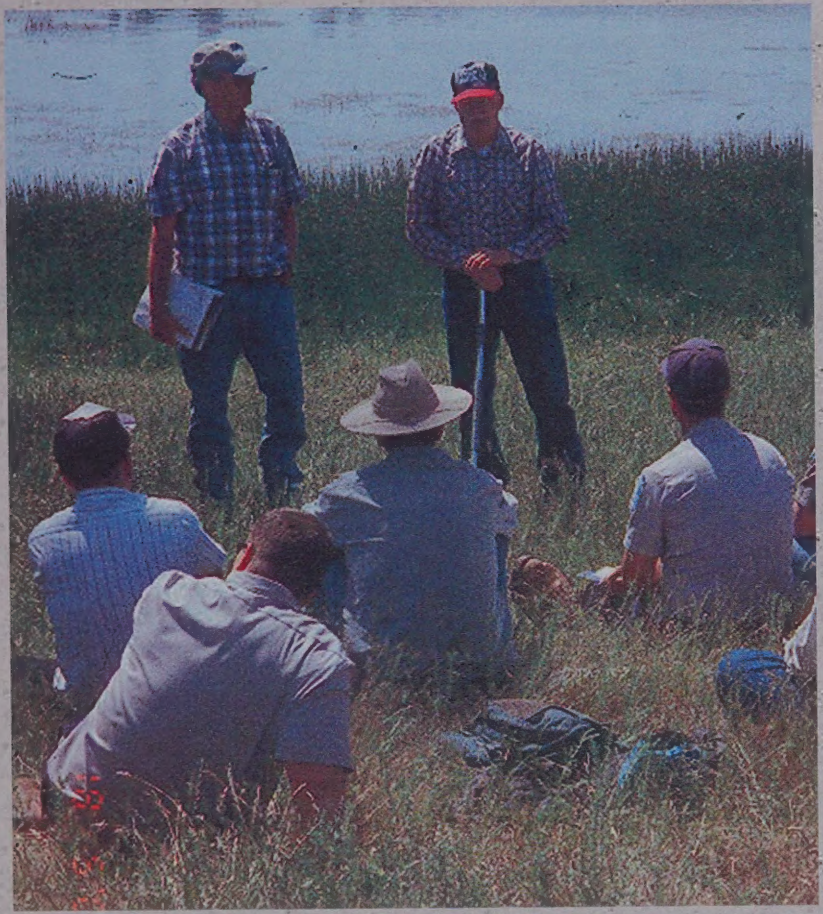
- Better decisions
- Improved relationships
- Sustainable communities and landscapes

Working Together for Creeks and Communities

- Given that the situation is complex, fraught with conflict and views polarized, how can people work together for common solutions?



Working Together for Creeks and Communities



- Bring affected interests together
- Create learning environments, build relationships/trust
- Build community information base
- Empower people

Build Ownership & Commitment

Working Together for Creeks and Communities

Bring Affected Interests Together

- Has an interest or concern (self-identified)
- May be needed to implement the outcome
- May try to undermine the effort

Working Together for Creeks and Communities

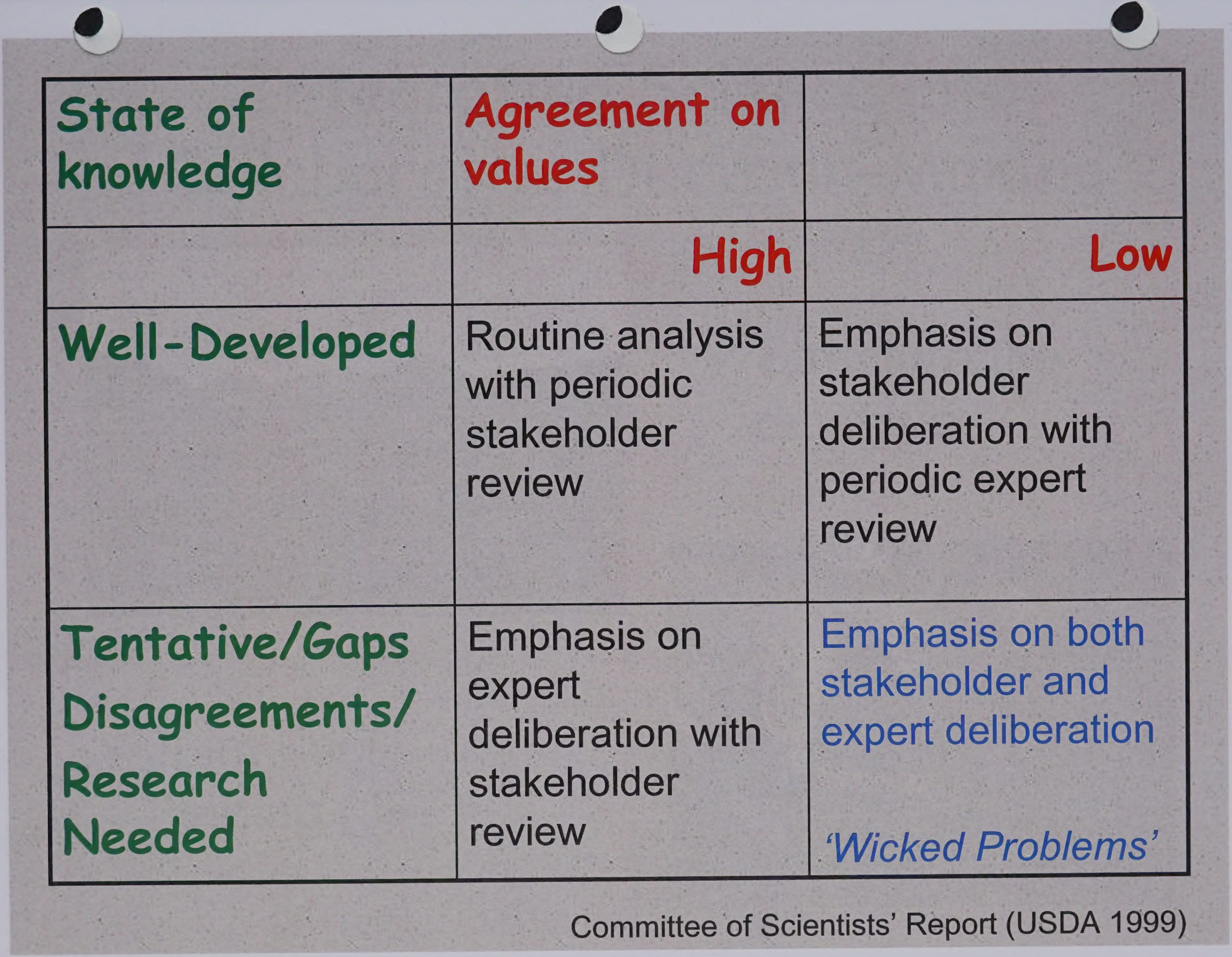
Create Learning Environments

- Listen with respect
- Explain basic ecological processes in a way everyone can understand.
- Listen to everyone for new possibilities and approaches

Working Together for Creeks and Communities

Build community information base

- Common Vocabulary
- Understanding of physical function
- Time, risk and cost
- Individual and watershed choices



State of knowledge	Agreement on values	
	High	Low
Well-Developed	Routine analysis with periodic stakeholder review	Emphasis on stakeholder deliberation with periodic expert review
Tentative/Gaps Disagreements/ Research Needed	Emphasis on expert deliberation with stakeholder review	Emphasis on both stakeholder and expert deliberation *‘Wicked Problems’*

Committee of Scientists’ Report (USDA 1999)

Integrating Science into Collaborative Decision-Making

- ✓ Structure the dialogue

- ✓ Joint Fact Finding (JFF)

The Creeks and Communities approach…

“places science in the hands of the average person, getting over the enormous hurdles of power and distrust”

James Honey, Sustainable Northwest

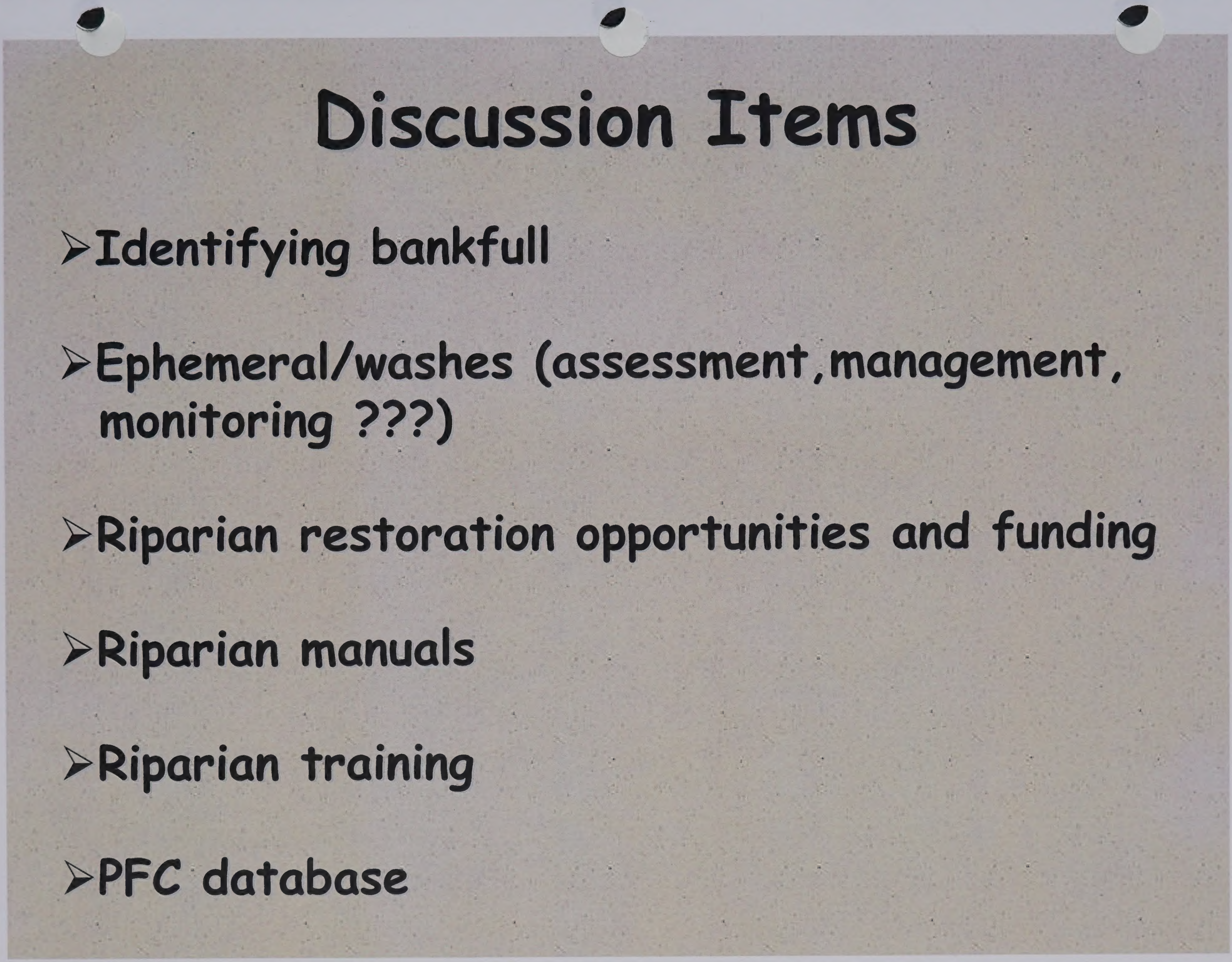
Working Together for Creeks and Communities

Empower people

(Community & Individuals)

- Improved relationships
- Trust
- Technical know how and support
- Financial support

Questions?



Discussion Items

- ➢Identifying bankfull
- ➢Ephemeral/washes (assessment, management, monitoring ???)
- ➢Riparian restoration opportunities and funding
- ➢Riparian manuals
- ➢Riparian training
- ➢PFC database

Air Quality

AZ Watershed Program
Action Plan-Group
Session